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# MONTHLY REPORT

OF THE

# DEPARTMENT OF AGRICULTURE

FOR

## JANUARY, 1872.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1872.

# MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,
*Statistical Division, January* 18, 1872.

SIR: I herewith present for publication the results of a statistical investigation of the rate of yield and home values of the principal products of agriculture, together with articles upon rice production, the progress of the beet-sugar manufacture in the United States, swamp-land reclamation, and the Potomac lands; also data from the divisions of chemistry and entomology, scientific notes, facts from foreign sources, and meteorological records for the month of December.

J. R. DODGE, *Statistician.*

Hon. FRED'K WATTS, *Commissioner.*

## YIELD AND PRICES OF FARM CROPS.

The January returns of statistical correspondence give the estimated yield, by counties, of each principal crop, and the actual prices at which an average quality of each product is sold in the home markets. These averages are combined in obtaining the rate of yield and prices (in home markets) of each State. The accompanying tables give these State averages of yield and price, for corn, wheat, rye, oats, barley, buckwheat, potatoes, tobacco, hay, and sorghum molasses.

YIELD OF CORN.—An increase in the amount produced, per acre, is shown in Massachusetts, Rhode Island, Connecticut, New Jersey, Maryland, Virginia, South Carolina, Missouri, Illinois, Minnesota, Iowa, Nebraska, Kansas, and California. The section west of the Mississippi River gives the highest averages, Iowa standing at the head of the list, at 42.5 bushels per acre; Nebraska following, at 41.5; Kansas, 40; Ohio, 38.5; Illinois, 38.3; Missouri, 38; Wisconsin, 37.7; Minnesota, 37.3; New Jersey, 36; Indiana, 35.7; New Hampshire, 35.7; Vermont, 35.6; Pennsylvania, 35.5; Massachusetts, 34.3; New York, 33; Connecticut, 31.4; the remaining States running below 30, down to 10 in South Carolina. The highest yield in the South is 26.7 bushels in Arkansas.

YIELD OF WHEAT.—The yield, per acre, of wheat is reported greater than last year in New Hampshire, in all the Middle States, in Maryland, Mississippi, Missouri, Illinois, Indiana, Ohio, and Kansas. The States reporting yields above 10 bushels per acre are Oregon, 19.2 bushels; Massachusetts, 18.2; New Jersey,18; California, 17.5 (possibly inaccurate, on account of non-receipt of returns from several wheat-growing counties;) New York, 17.2; Connecticut, 17; Vermont, 16.6; Pennsylvania, 16.2; Kansas, 15.9; New Hampshire, 15.2; Michigan, 14; Ohio, 13.9; Missouri, 13.4; Maine, 13; Illinois, 12.3; Wisconsin, 12.2; In-

diana, 12; Maryland, 12; Delaware, 11.5; Texas, 11.5; Minnesota, 11; Iowa, 10.8; Nebraska, 10.3; West Virginia, 10. The lowest average is 5 bushels in South Carolina, Georgia, and Tennessee.

For averages of these and other crops, reference is made to the tables which follow.

## PRICES OF FARM PRODUCTS.

PRICE OF CORN.—A material reduction in the home prices of corn, from the quotations of last year, is reported from all the Northern and Western States. The product of the New England States, while bearing a higher price than that received from other sections, is somewhat depressed in value by the present abundance of western corn. The home markets of Pennsylvania, creating an active local demand, have helped to keep up the local prices. In most of the Southern States, in which less is grown than is required for consumption, rates are fully sustained. In Louisiana there is a great difference between the quotations of the river parishes and those in the interior, where the supply is mainly from the home product. In Texas the severe drought, reducing the estimated yield of 1870 from 26 bushels per acre to 19, has had a large influence in placing the average price at $1 11 instead of $1 06 per bushel. Arkansas has felt the effect of western abundance on the lines of inland navigation and of a fair yield on an enlarged area at home, reducing the average from 80 to 66 cents. Tennessee, more dependent upon home supplies, increases last year's average of 47 cents to 51 cents, while showing a yield reduced from 25.8 to 23 bushels per acre. The yield per acre in West Virginia and Kentucky is less than in 1870, and the reduction in price is from 64 to 63 cents in the former State and from 48 to 47 cents in the latter. In Michigan, with a yield reduced from 37 bushels to 32, the price has advanced from 55 to 59 cents. In all of the remaining Western States the average of reported prices is less than last year, and the yield per acre is greater except in Indiana, where the acreage was increased four per cent., and in Ohio and Wisconsin, in which the difference is very slight. The yield in the latter State, estimated at 38 bushels for the crop of 1870, is placed between 37 and 38 bushels by the assessors' returns of that year. The figures for these States are as follows:

| States. | JANUARY, 1872. | | JANUARY 1871. | |
|---|---|---|---|---|
| | Yield. | Price. | Yield. | Price. |
| | *Bushels.* | *Cents.* | *Bushels.* | *Cents.* |
| Ohio | 38.5 | 45 | 39 | 48 |
| Indiana | 35.7 | 37 | 39.5 | 38 |
| Illinois | 38.3 | 32 | 35.2 | 35 |
| Wisconsin | 37.7 | 43 | 38 | 52 |
| Minnesota | 37.3 | 44 | 33 | 51 |
| Iowa | 42.5 | 23 | 32 | 34 |
| Missouri | 38 | 31 | 31.4 | 44 |
| Kansas | 40 | 29 | 28 | 58 |
| Nebraska | 41.5 | 25 | 29 | 36 |

The lowest rate reached is that of Iowa, dropping from 34 to 23 cents, with a yield of 42.5 instead of 32 bushels per acre; that of Nebraska falls from 36 to 25 cents; and of Kansas from 58 to 29 cents, the estimated yield having advanced from 28 bushels (a very small crop for Kansas) to 40 bushels this year.

The following table gives the estimated home prices of corn in January of each year since 1866:

*Average price of corn per bushel on the 1st of January.*

| States. | 1872. | 1871. | 1870. | 1869. | 1868. | 1867. | 1866. |
|---|---|---|---|---|---|---|---|
| Maine | $0 98 | $1 14 | $1 27 | $1 38 | $1 59 | $1 35 | $1 21 |
| New Hampshire | 95 | 1 09 | 1 30 | 1 43 | 1 56 | 1 37.5 | 1 21.5 |
| Vermont | 99 | 1 10 | 1 40 | 1 34 | 1 52 | 1 41 | 1 15.25 |
| Massachusetts | 98 | 98 | 1 32 | 1 32 | 1 53 | 1 34 | 1 10.5 |
| Rhode Island | 99 | 1 06 | 1 28 | 1 65 | 1 64 | 1 42 | 1 22.5 |
| Connecticut | 1 07 | 1 14 | 1 30 | 1 35 | 1 50 | 1 26 | 1 22.5 |
| New York | 82 | 87 | 1 03 | 1 12 | 1 32 | 1 16 | 95 |
| New Jersey | 75 | 81 | 95 | 99 | 1 23 | 1 03 | 85.5 |
| Pennsylvania | 75 | 75 | 92 | 1 00 | 1 17 | 91 | 80 |
| Delaware | 60 | 65 | ..... | 85 | 1 02 | 87 | 75 |
| Maryland | 64 | 71 | 73 | 87 | 1 09 | 93 | 76.10 |
| Virginia | 67 | 65 | 91 | 76 | 85 | 73 | ..... |
| North Carolina | 71 | 78 | 1 00 | 78 | 1 04 | 1 12 | ..... |
| South Carolina | 92 | 1 06 | 1 40 | 1 00 | 1 15 | 1 58 | ..... |
| Georgia | 93 | 90 | 1 21 | 91 | 96 | 1 52 | ..... |
| Florida | 1 09 | 1 35 | 1 45 | 1 41 | 1 38 | 1 50 | ..... |
| Alabama | 92 | 93 | 1 14 | 86 | 79 | 1 51 | ..... |
| Mississippi | 98 | 98 | 1 12 | 74 | 1 09 | 1 57 | ..... |
| Louisiana | 1 12 | 1 10 | 1 09 | 75 | 1 10 | 1 23 | ..... |
| Texas | 1 11 | 1 06 | 73 | 62 | 75 | 94 | ..... |
| Arkansas | 66 | 80 | 92 | 63 | 77 | 1 14 | ..... |
| Tennessee | 51 | 47 | 77 | 49 | 55 | 77 | ..... |
| West Virginia | 63 | 64 | 79 | 75 | 89 | 64 | 53.66 |
| Kentucky | 47 | 48 | 66 | 47 | 65 | 49 | 43.33 |
| Missouri | 31 | 44 | 60 | 57 | 66 | 58 | 52 |
| Illinois | 32 | 35 | 57 | 43 | 68 | 43 | 29.25 |
| Indiana | 37 | 38 | 70 | 52 | 65 | 44 | 38.70 |
| Ohio | 45 | 48 | 72 | 60 | 82 | 54 | 44.42 |
| Michigan | 59 | 55 | 74 | 76 | 96 | 82 | 60.11 |
| Wisconsin | 43 | 52 | 65 | 58 | 86 | 82 | 46 |
| Minnesota | 44 | 51 | 63 | 64 | 1 07 | 1 11 | 51.5 |
| Iowa | 23 | 34 | 50 | 37 | 55 | 44 | 30 |
| Kansas | 29 | 58 | 44 | 99 | 55 | 63 | 53 |
| Nebraska | 25 | 36 | 37 | 69 | 74 | 68 | 59 |
| California | 1 16 | 1 20 | 90 | ..... | ..... | ..... | ..... |
| Oregon | ..... | 1 00 | ..... | ..... | ..... | ..... | ..... |

This table shows that corn was highest in price in 1868, the rate receding in 1869, and again advancing in January, 1870, as a result of the small crop of 1869. The occurrence of two large crops in succession, in 1870 and 1871, has had an important influence in depressing the value of this production to a lower point than has been reached since the war.

In these tables, so full of local variation and fluctuation, are seen the results of meager crops, of the greater prominence of other products, of demand springing from the employment of labor in other industries on the one hand; and on the other the effect of abundance and a large ratio of corn acreage to the cultivated area. An examination of the record, by counties, would show the influence of isolation from railways and river navigation, and of other local circumstances.

PRICE OF WHEAT.—An advance in the averages of county prices of wheat, since January of last year, is made in every State. The crop was an average one, but not so large as that of last year, while the export demand to supply the large deficiency in Great Britain, and that portion of the large deficit in France which shall not be provided for by the substitution of coarser grains and other products, has been unusually pressing. The increase in value in the principal wheat-producing States is as follows:

| States. | January, 1872. | January, 1871. | States. | January, 1872. | January, 1871. |
|---|---|---|---|---|---|
| Ohio | 1.26 | 1.09 | Wisconsin | 1.11 | .90 |
| Indiana | 1.26 | 1.00 | Minnesota | 1.00 | .83 |
| Michigan | 1.32 | 1.08 | Iowa | .96 | .78 |
| Illinois | 1.18 | .94 | Missouri | 1.16 | .91 |

The prices of past years, as reported by county correspondents, the State averages of which are recorded in the following table, do not show fluctuations and variations so striking as those which appear in the table for corn, but afford a sufficiently vivid illustration of the effect of the rate of yield, distance from market, the relation of home supply to local demand, and other local causes of fluctuations. Prices were highest in 1867, and the lowest in January, 1870, after the great crop of 1869; higher again in January, 1871, and now advanced still further. In Minnesota, Iowa, and Nebraska, the averages are higher than in January, 1869, but in other wheat-growing sections they do not equal the rates recorded at that date.

*Average price of wheat per bushel on January 1.*

| | 1872. | 1871. | 1870. | 1869. | 1868. | 1867. | 1866. |
|---|---|---|---|---|---|---|---|
| Maine | $1 80 | $1 78 | $1 83 | $2 40 | $2 79 | $2 86 | $2 21 |
| New Hampshire | 1 72 | 1 59 | 1 85 | 2 42 | 2 89 | 2 58 | 2 60 |
| Vermont | 1 64 | 1 63 | 1 57 | 2 26 | 2 76 | 2 67 | 2 18 |
| Massachusetts | 1 76 | 1 75 | 1 75 | 2 40 | 2 81 | 2 78 | 2 21 |
| Rhode Island | ..... | ..... | ..... | ..... | ..... | 2 80 | ..... |
| Connecticut | 1 55 | 1 52 | 1 40 | 2 00 | 2 63 | 2 83 | 2 37 |
| New York | 1 51 | 1 41 | 1 37 | 2 08 | 2 64 | 2 67 | 2 08 |
| New Jersey | 1 54 | 1 43 | 1 34 | 2 11 | 2 58 | 2 93 | 2 32 |
| Pennsylvania | 1 45 | 1 27 | 1 28 | 1 98 | 2 43 | 2 67 | 2 05 |
| Delaware | 1 52 | 1 25 | ..... | 1 90 | 2 38 | 3 00 | 2 00 |
| Maryland | 1 52 | 1 28 | 1 30 | 2 09 | 2 43 | 2 94 | 2 06 |
| Virginia | 1 39 | 1 24 | 1 21 | 1 90 | 2 12 | 2 85 | ..... |
| North Carolina | 1 42 | 1 21 | 1 53 | 2 00 | 2 11 | 2 72 | ..... |
| South Carolina | 2 03 | 1 89 | 2 09 | 2 25 | 2 38 | 3 19 | ..... |
| Georgia | 1 66 | 1 47 | 1 65 | 2 20 | 2 35 | 2 72 | ..... |
| Florida | ..... | ..... | ..... | 2 75 | ..... | ..... | ..... |
| Alabama | 1 56 | 1 28 | 1 62 | 1 98 | 2 05 | 2 34 | ..... |
| Mississippi | 1 59 | 1 52 | 1 75 | 2 19 | 2 40 | 2 53 | ..... |
| Louisiana | ..... | ..... | 1 25 | ..... | 2 50 | 2 50 | ..... |
| Texas | 1 97 | 1 73 | 1 70 | 2 25 | 1 89 | 1 45 | ..... |
| Arkansas | 1 55 | 1 30 | 1 51 | 2 00 | 2 01 | 2 06 | ..... |
| Tennessee | 1 28 | 97 | 1 15 | 1 88 | 2 11 | 2 21 | ..... |
| West Virginia | 1 31 | 1 22 | 1 26 | 1 88 | 2 39 | 2 67 | 1 89 |
| Kentucky | 1 29 | 1 00 | 1 10 | 1 86 | 2 17 | 2 30 | 1 70 |
| Missouri | 1 16 | 91 | 80 | 1 49 | 2 00 | 2 01 | 1 62 |
| Illinois | 1 18 | 94 | 76 | 1 20 | 1 97 | 1 93 | 1 09 |
| Indiana | 1 26 | 1 00 | 93 | 1 50 | 2 21 | 2 41 | 1 35 |
| Ohio | 1 26 | 1 09 | 1 03 | 1 65 | 2 36 | 2 52 | 1 59 |
| Michigan | 1 32 | 1 08 | 97 | 1 64 | 2 34 | 2 55 | 1 65 |
| Wisconsin | 1 11 | 90 | 68 | 1 00 | 1 77 | 1 67 | 1 09 |
| Minnesota | 1 00 | 83 | 59 | 83 | 1 48 | 1 36 | 80 |
| Iowa | 96 | 78 | 52 | 95 | 1 43 | 1 42 | 1 00 |
| Kansas | 1 13 | 86 | 79 | 1 35 | 1 84 | 1 91 | 1 77 |
| Nebraska | 90 | 64 | 51 | 96 | 1 32 | 1 23 | 1 49 |
| California | 1 41 | 1 10 | 93 | ..... | ..... | ..... | ..... |
| Oregon | ..... | 95 | ..... | ..... | ..... | ..... | ..... |

PRICE OF HAY.—The short crop of 1871 has made prices higher than for several years. The advance is greatest in the Eastern and Middle States, in Texas and in California. The States showing a decline are Delaware, Georgia, Alabama, Louisiana, Missouri, Illinois, Minnesota, Iowa, Nebraska, and Kansas. The highest average reported is that of New Jersey, $26 70 per ton; the lowest, that of Nebraska, $4 76. The average for the Southern States exceeds $21—a region where hay of suitable grasses can be cheaply grown, though there is a prevalent contrary opinion elsewhere which may even be shared by southern agriculturists. The average for the Middle States, with their millions of city population, is but little larger. The following is a statement of the average prices of hay in the several States for seven years past:

*Average price of hay per ton, January 1.*

| States. | 1872. | 1871. | 1870. | 1869. | 1868. | 1867. | 1866. |
|---|---|---|---|---|---|---|---|
| Maine | $26 00 | $19 69 | $15 25 | $12 00 | $14 62 | $19 28 | $11 81 |
| New Hampshire | 23 00 | 19 85 | 15 00 | 13 50 | 15 00 | 17 88 | 14 70 |
| Vermont | 17 50 | 14 50 | 13 00 | 14 50 | 15 36 | 15 61 | 11 50 |
| Massachusetts | 29 60 | 26 14 | 24 42 | 18 37 | 22 12 | 28 39 | 21 00 |
| Rhode Island | 33 33 | 24 00 | 21 75 | 20 00 | 26 62 | 31 66 | 22 50 |
| Connecticut | 31 20 | 25 60 | 18 00 | 17 25 | 21 60 | 25 60 | 23 50 |
| New York | 19 42 | 17 21 | 12 66 | 15 00 | 17 47 | 16 18 | 12 33 |
| New Jersey | 26 70 | 19 44 | 20 20 | 19 00 | 22 13 | 25 00 | 13 89 |
| Pennsylvania | 20 76 | 13 05 | 14 85 | 16 00 | 14 83 | 16 14 | 11 23 |
| Delaware | 17 50 | 20 00 | ..... | 20 00 | 17 66 | 17 50 | 17 00 |
| Maryland | 25 71 | 16 33 | 17 95 | 16 77 | 17 54 | 20 27 | 16 42¼ |
| Virginia | 17 82 | 14 72 | 15 41 | 13 00 | 12 48 | 14 28 | ..... |
| North Carolina | 12 30 | 11 47 | 12 11 | 15 00 | 12 06 | 13 00 | ..... |
| South Carolina | 21 60 | 21 66 | 23 33 | 17 00 | 19 50 | 22 00 | ..... |
| Georgia | 23 06 | 23 33 | 21 45 | 21 90 | 21 58 | 23 62 | ..... |
| Florida | ..... | ..... | ..... | ..... | ..... | 20 62 | ..... |
| Alabama | 19 50 | 20 00 | 26 25 | 19 28 | 20 00 | 18 63 | ..... |
| Mississippi | 21 66 | 21 25 | 19 33 | 17 00 | 16 43 | 27 50 | ..... |
| Louisiana | 25 00 | 28 50 | ..... | 10 00 | 19 75 | 30 00 | ..... |
| Texas | 24 33 | 15 36 | 14 18 | 10 00 | 16 60 | 13 60 | ..... |
| Arkansas | 20 87 | 15 00 | 12 60 | 16 00 | 20 75 | 26 43 | ..... |
| Tennessee | 16 58 | 16 64 | 20 34 | 15 50 | 18 95 | 18 63 | ..... |
| West Virginia | 14 58 | 10 00 | 11 17 | 15 00 | 11 44 | 12 22 | 8 00 |
| Kentucky | 14 27 | 13 25 | 14 66 | 13 25 | 14 80 | 12 80 | 12 10 |
| Missouri | 10 66 | 12 82 | 11 17 | 11 00 | 11 11 | 9 91 | 12 33 |
| Illinois | 10 05 | 10 74 | 9 87 | 10 00 | 9 73 | 9 27 | 9 30 |
| Indiana | 12 78 | 11 46 | 10 52 | 11 09 | 11 63 | 9 44 | 9 40 |
| Ohio | 11 91 | 11 02 | 10 90 | 13 80 | 12 32 | 11 00 | 8 60 |
| Michigan | 17 33 | 11 17 | 12 80 | 15 00 | 16 14 | 13 75 | 12 16⅔ |
| Wisconsin | 10 63 | 10 43 | 10 50 | 11 00 | 11 11 | 12 25 | 10 14 |
| Minnesota | 6 27 | 6 77 | 8 60 | 7 00 | 7 28 | 7 00 | 8 59 |
| Iowa | 6 09 | 7 70 | 7 70 | 6 50 | 5 77 | 6 20 | 7 35½ |
| Kansas | 4 91 | 7 18 | 5 55 | 8 16 | 5 08 | 7 18 | 8 00 |
| Nebraska | 4 76 | 5 60 | 5 03 | 5 40 | 5 54 | 6 43 | 5 64 |
| California | 21 85 | 16 70 | 12 70 | ..... | ..... | ..... | ..... |
| Oregon | ..... | 12 05 | ..... | ..... | ..... | ..... | ..... |
| Colorado | ..... | ..... | ..... | ..... | ..... | 19 00 | ..... |
| Utah | ..... | ..... | ..... | ..... | ..... | 17 50 | ..... |

*Table showing the average yield per acre and price of the principal crops of the United States for* 1871, *and the area and condition of winter grain.*

| States. | CORN. | | WHEAT. | | RYE. | | OATS. | | BARLEY. | | BUCKWHEAT. | | POTATOES, (Solanum tuberosum.) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Average *yield* per acre in 1871, stated in bushels. | Average *price* per bushel January 1, 1872. | Average *yield* per acre in 1871, stated in bushels. | Average *price* per bushel January 1, 1872. | Average *yield* per acre in 1871, stated in bushels. | Average *price* per bushel January 1, 1872. | Average *yield* per acre in 1871, stated in bushels. | Average *price* per bushel January 1, 1872. | Average *yield* per acre in 1871, stated in bushels. | Average *price* per bushel January 1, 1872. | Average *yield* per acre in 1871, stated in bushels. | Average *price* per bushel January 1, 1872. | Average *yield* per acre in 1871, stated in bushels. | Average *price* per bushel January 1, 1872. |
| Maine | 27.2 | $0 98 | 13 | $1 80 | 17.2 | $1 19 | 25 | $0 66 | 21.5 | $0 87 | 21 | $0 91 | 142 | $0 46 |
| New Hampshire | 35.7 | 95 | 15.2 | 1 72 | 18.5 | 1 13 | 37 | 63 | 29.4 | 98 | 18.7 | 71 | 140 | 49 |
| Vermont | 35.6 | 99 | 16.6 | 1 62 | 16 | 1 11 | 35.5 | 53 | 22.8 | 1 22 | 21 | 70 | 160 | 37 |
| Massachusetts | 34.3 | 98 | 18.2 | 1 68 | 18 | 1 12 | 31.4 | 70 | 24.2 | 1 07 | 15 | 1 07 | 126 | 68 |
| Rhode Island | 27.3 | 99 | ..... | ..... | 19.6 | 1 05 | 33.3 | 60 | 23 | 1 00 | ..... | ..... | 90 | 73 |
| Connecticut | 31.4 | 1 07 | 17 | 1 55 | 14.2 | 1 17 | 31.6 | 65 | ..... | ..... | 24 | 1 00 | 106 | 68 |
| New York | 33 | 82 | 17.2 | 1 51 | 16.6 | 88 | 39.1 | 51 | 25.9 | 78 | 24.1 | 78 | 107 | 42 |
| New Jersey | 36 | 75 | 18 | 1 54 | 15 | 94 | 33.3 | 52 | ..... | ..... | 16 | 92 | 96 | 66 |
| Pennsylvania | 35.5 | 77 | 16.2 | 1 45 | 14.6 | 86 | 31 | 49 | 18.6 | 90 | 21.1 | 93 | 112 | 55 |
| Delaware | 22 | 60 | 11.5 | 1 52 | 5 | 75 | 20 | 41 | ..... | ..... | 12.5 | 77 | 120 | 50 |
| Maryland | 23.6 | 64 | 12 | 1 52 | 11.5 | 85 | 17.7 | 48 | ..... | ..... | 14.2 | 97 | 71 | 71 |
| Virginia | 22.6 | 67 | 8 | 1 39 | 13.6 | 71 | 16.4 | 49 | ..... | ..... | 14.4 | 82 | 71 | 71 |
| North Carolina | 14 | 71 | 6 | 1 42 | 6.6 | 86 | 10.6 | 63 | ..... | ..... | 11.6 | 61 | 105 | 71 |
| South Carolina | 10 | 92 | 5 | 2 03 | 7.1 | 1 55 | 8.9 | 87 | ..... | ..... | ..... | ..... | 95 | 1 38 |
| Georgia | 10.3 | 93 | 5 | 1 66 | 7.3 | 1 56 | 10.7 | 80 | 14.6 | 1 77 | ..... | ..... | 96 | 1 42 |
| Florida | 10.7 | 1 09 | ..... | ..... | 11.5 | 1 50 | 13 | 1 01 | ..... | ..... | ..... | ..... | 73 | 1 93 |
| Alabama | 14.5 | 92 | 6.3 | 1 56 | 9.2 | 1 80 | 13.4 | 87 | ..... | ..... | ..... | ..... | 85 | 1 06 |
| Mississippi | 14 | 98 | 10 | 1 59 | 9.2 | 1 70 | 13.8 | 96 | ..... | ..... | ..... | ..... | 88 | 1 35 |
| Louisiana | 14.4 | 1 12 | ..... | ..... | ..... | ..... | 20 | 1 12 | ..... | ..... | ..... | ..... | 60 | 1 37 |
| Texas | 19 | 1 11 | 11.5 | 1 97 | 12.1 | 1 65 | 25.1 | 1 04 | ..... | ..... | ..... | ..... | 105 | 1 85 |
| Arkansas | 26.7 | 66 | 8.4 | 1 55 | 12 | 1 75 | 25 | 73 | ..... | ..... | ..... | ..... | 82 | 1 11 |
| Tennessee | 23 | 51 | 5 | 1 28 | 8.4 | 92 | 15.2 | 46 | 17.8 | 72 | 8.2 | 90 | 80 | 68 |
| West Virginia | 27.6 | 63 | 10 | 1 31 | 13 | 87 | 25.1 | 44 | 11 | 70 | 14.1 | 92 | 73 | 66 |
| Kentucky | 27.3 | 47 | 6.1 | 1 29 | 9.4 | 81 | 24.3 | 41 | 22 | 84 | 25 | 1 25 | 69 | 78 |
| Missouri | 38 | 31 | 13.4 | 1 16 | 17.1 | 59 | 28.3 | 30 | 27.5 | 62 | 22.1 | 71 | 78 | 64 |
| Illinois | 38.3 | 32 | 12.3 | 1 18 | 17.8 | 56 | 33.1 | 28 | 25.5 | 52 | 14.1 | 74 | 61 | 85 |
| Indiana | 35.7 | 37 | 12 | 1 26 | 13.9 | 72 | 28.8 | 33 | 27.4 | 72 | 13.5 | 75 | 64 | 82 |
| Ohio | 38.5 | 45 | 13.9 | 1 26 | 14.5 | 77 | 34.7 | 35 | 26.1 | 74 | 14.5 | 96 | 96 | 63 |
| Michigan | 32.4 | 59 | 14 | 1 32 | 14.4 | 76 | 34.2 | 41 | 23.2 | 93 | 15 | 79 | 68 | 83 |
| Wisconsin | 37.7 | 43 | 12.2 | 1 11 | 16.1 | 60 | 38.6 | 35 | 29.9 | 56 | 18.3 | 62 | 105 | 55 |
| Minnesota | 37.3 | 44 | 11 | 1 00 | 16.8 | 63 | 33.8 | 34 | 25.4 | 46 | 20.7 | 84 | 123 | 39 |
| Iowa | 42.5 | 23 | 10.8 | 96 | 19.9 | 51 | 41.1 | 21 | 29.6 | 46 | 26.7 | 72 | 131 | 38 |
| Kansas | 40 | 29 | 15.9 | 1 13 | 19 | 67 | 31.8 | 30 | 21.8 | 70 | 15.2 | 93 | 97 | 69 |
| Nebraska | 41.5 | 25 | 10.3 | 90 | 18 | 55 | 31.8 | 25 | 29.6 | 46 | 16 | 94 | 124 | 32 |
| California | 38 | 1 16 | 17.5 | 1 41 | 27 | 1 40 | 40 | 70 | 28.4 | 1 08 | 26 | 1 30 | 152 | 91 |
| Oregon | 26.6 | 1 00 | 19.2 | 1 04 | 25 | 95 | 29.7 | 77 | 29 | 84 | 20 | 1 40 | 76 | 1 03 |

*Table showing the average yield per acre and price of the principal crops, &c.*—Continued.

| States. | POTATOES, (Batatus edulis, sweet.) | | LEAF-TOBACCO. | | HAY. | | SORGHUM MOLASSES. | | WINTER-WHEAT. | | WINTER-RYE. | | WINTER-BARLEY. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Average *yield* per acre in 1871, stated in bushels. | Average *price* per bushel January 1, 1872. | Average *yield* per acre in 1871, stated in *pounds*. | Average *price* per pound January 1, 1872. | Average *yield* per acre in 1871, stated in *tons*. | Average *price* per ton January 1, 1872. | Average *yield* per acre in 1871, stated in *gallons*. | Average *price* per gallon January 1, 1872. | Average am't sown compared with 1870. | Condition of the crop compared with an average. | Average am't sown compared with 1870. | Condition of the crop compared with an average. | Average am't sown compared with 1870. | Condition of the crop compared with an average. |
| Maine | | | | | .46 | $26 00 | | | 125 | | 95 | 97 | | |
| New Hampshire | | | | | .97 | 23 00 | | | 98 | 100 | 98 | 98 | | |
| Vermont | | | | | 1.02 | 17 50 | | | | | | | | |
| Massachusetts | | | 1,450 | $0 20.5 | .96 | 29 60 | | | 55 | 150 | 80 | 94 | 106 | |
| Rhode Island | | | | | .91 | 33 33 | | | | | 100 | 100 | | |
| Connecticut | | | 1,700 | 27.6 | 1.11 | 31 20 | | | | | 100 | 100 | | |
| New York | | | 657 | 12.6 | 1.22 | 19 42 | | | 98 | 94 | 99 | 98 | 91 | 92 |
| New Jersey | 75 | $0 90 | | | 1.30 | 26 70 | | | 100 | 97 | 98 | 109 | | |
| Pennsylvania | 100 | 88 | 1,200 | 15.2 | .93 | 20 76 | 92 | $0 60 | 101 | 92 | 101 | 95 | 92 | 110 |
| Delaware | 112 | 87 | | | 1.25 | 17 50 | 60 | 50 | 100 | 90 | 100 | 100 | | |
| Maryland | 112 | 94 | 650 | 8.2 | 1.00 | 25 71 | 100 | 62 | 101 | 95 | 96 | 98 | | 97 |
| Virginia | 92 | 80 | 708 | 10.8 | 1.21 | 17 82 | 85 | 62 | 94 | 102 | 93 | 90 | | |
| North Carolina | 101 | 62 | 599 | 10.3 | 1.13 | 12 30 | 73 | 52 | 100 | 95 | 101 | 98 | 103 | 96 |
| South Carolina | 79 | 71 | | | .60 | 21 60 | 59 | 56 | 95 | 100 | 98 | 100 | | |
| Georgia | 99 | 62 | 350 | 21.4 | 1.50 | 23 06 | 92 | 56 | 101 | 95 | 100 | 97 | 110 | 102 |
| Florida | 127 | 70 | | | | | 150 | 45 | | | 100 | 103 | | |
| Alabama | 103 | 67 | | | 1.33 | 19 50 | 76 | 62 | 115 | 109 | 100 | 112 | | |
| Mississippi | 85 | 73 | | | 1.45 | 21 66 | 73 | 76 | 91 | 91 | 100 | 96 | | |
| Louisiana | 108 | 82 | | | 1.50 | 25 00 | | | | | | | | |
| Texas | 118 | 91 | 660 | 24 | 1.07 | 24 33 | 72 | 83 | 115 | 107 | 105 | 112 | | |
| Arkansas | 120 | 93 | 833 | 14.5 | 1.67 | 20 87 | 133 | 57 | 101 | 87 | 89 | 94 | | |
| Tennessee | 100 | 77 | 741 | 11 | 1.48 | 16 58 | 81 | 58 | 96 | 99 | 97 | 99 | 107 | 104 |
| West Virginia | 91 | 1 27 | 605 | 14.4 | .97 | 14 58 | 71 | 67 | 97 | 97 | 93 | 97 | 111 | 95 |
| Kentucky | 78 | 1 06 | 724 | 7.7 | 1.20 | 14 27 | 81 | 56 | 88 | 101 | 90 | 97 | 103 | 92 |
| Missouri | 95 | 1 02 | 822 | 8.3 | 1.55 | 10 66 | 98 | 51 | 97 | 80 | 95 | 90 | 91 | 92 |
| Illinois | 80 | 1 22 | 731 | 6.6 | 1.31 | 10 05 | 96 | 58 | 101 | 89 | 89 | 89 | 100 | 85 |
| Indiana | 90 | 1 25 | 702 | 8.5 | 1.19 | 12 78 | 82 | 54 | 97 | 84 | 95 | 88 | 100 | 91 |
| Ohio | 135 | 1 30 | 828 | 9.1 | 1.22 | 11 91 | 101 | 59 | 93 | 82 | 94 | 85 | 85 | 86 |
| Michigan | | | | | 1.12 | 17 33 | 70 | 81 | 92 | 78 | 93 | 85 | 101 | 90 |
| Wisconsin | | | 1,200 | 11 | 1.45 | 10 63 | 60 | 55 | 107 | 93 | 99 | 99 | 103 | 100 |
| Minnesota | | | | | 1.55 | 6 27 | 73 | 71 | 162 | 99 | 105 | 70 | | |
| Iowa | 110 | 91 | | | 1.64 | 6 09 | 121 | 57 | 120 | 98 | 88 | 91 | | |
| Kansas | 123 | 1 15 | | | 1.90 | 4 91 | 110 | 58 | 105 | 80 | 97 | 92 | 100 | 103 |
| Nebraska | 100 | 2 12 | | | 1.80 | 4 76 | 105 | 61 | 134 | 113 | 115 | 116 | | |
| California | | 1 10 | | | 1.29 | 21 85 | | | 132 | 100 | | | 115 | 100 |
| Oregon | | | | | 1.62 | 19 40 | | | 117 | 98 | | | | |

# CONDITION OF WINTER WHEAT.

The following extracts of notes from regular correspondents will give some indication of the condition of winter wheat:

VERMONT.—*Grand Isle:* Wheat is not raised here to any extent; apt to winter-kill.

NEW YORK.—*Genesee:* Was sown in good season, but owing to dry weather the growth is small. *Otsego:* Is not in a satisfactory condition; the autumn was dry and the growth slow and feeble. *Putnam:* The prospects are better than for three years past. *Steuben:* Looks unfavorable.

NEW JERSEY.—*Burlington:* Shows less top than usual.

PENNSYLVANIA.—*Bradford:* Has had a very unfavorable autumn, and the growth is very poor. *Chester:* Winter unfavorable, and the prospects poor. *Clearfield:* Looking well. *Clinton:* Looks bad; small when winter set in and without snow to protect it. *Franklin:* In some parts of the county injured by "the fly." *Greene:* Not looking well, though yet uninjured materially by the winter. *Indiana:* Is not in a favorable condition, and a short crop is feared. *Lancaster:* In appearance, poor; the winter has been very severe. *Luzerne:* Has had favorable weather so far. *Lycoming:* Looks badly; no snow to protect it from the intensely cold weather. *Tioga:* Failed to come up in some instances; weather dry bitterly cold. *Westmoreland:* Has but little snow to protect it from the cold.

MARYLAND.—*Baltimore:* Is short, but seems in good condition. *Cecil:* Was sown early; in some fields it is injured by "the fly." *Washington:* Does not promise well; the fields look bare.

VIRGINIA.—*Campbell:* Is looking extremely well at the present time. *Chesterfield:* Looks well; the acreage considerably increased. *Culpeper:* Looking better than at this time last year; that sown by the drill invariably looks the best. *Cumberland:* Unpromising, owing to the severe weather in December. *Fluvanna:* So far looks well; the growth is promising. *King and Queen:* Is suffering from the unfavorable weather. *King George:* Looks well, has suffered but little from extremely cold weather. *Mecklenburg:* Made a fair growth, with a fine stand before the cold weather set in. *Orange:* Came up well and promised a better harvest than usual; the acreage is somewhat decreased. *Prince George:* Less acreage than last year, owing to the rainy season. *Pulaski:* Is promising; the freezing weather does not seem to have damaged it. *Rappahannock:* Owing to the drought, the acreage is less than heretofore. *Rockbridge:* Has been injured by the weather. *Spottsylvania:* Looks very promising; a larger acreage has been sown. *Surry:* Is small; it seems to have suffered from cold; there is an increase in the acreage, but put in without fertilizers. *Washington:* Looking badly; owing to the drouth the acreage sown was lessened. *Wythe:* Was sown in less quantity, owing to the dry weather.

NORTH CAROLINA.—*Beaufort:* Not a great amount cultivated, and badly injured. *Craven:* But little sown in this county. *Gaston:* Sown in excess of last year and looks well. *Hertford:* Much below an average quantity sown and it looks unpromising. *New Hanover:* Is sown in such small quantities as hardly deserving of notice. *Northampton:* Sown in smaller quantities than usual. *Rockingham:* Looking well so far. *Stanley:* Looks well, the stand being much better than was feared. *Warren:* Very unfavorable weather.

SOUTH CAROLINA.—*Anderson:* Looks well. *Greenville:* Is in fine condition, having been covered twice by snow. *Richland:* Is seldom cultivated except in small lots for home use. *York:* Has been retarded in its growth by the cold weather.

GEORGIA.—*Cobb:* The Tappahannock wheat, sent by the Department of Agriculture, is beginning to show its superiority over other kinds sown as winter-wheat; the crop heretofore has been a failure. *Douglas:* An increased acreage sown last autumn but the severe weather has prevented it from coming up to any extent. *Richmond:* Looks very well, though little was sown this season. *Worth:* The rust has spoiled this crop so that farmers are beginning to despair, merely planting a little for home use.

ALABAMA.—*Colbert:* Is small though promising; more than usual care was taken in preparing the ground, and the crop may be above the average. *Greene:* An increasing interest in this crop is manifested.

MISSISSIPPI.—*Lee:* Destroyed by the wet weather.

TEXAS.—*Gillespie:* Sown early, is in very good condition; that late-sown needs rain. *Kaufman:* Looks well; that received from the Department of Agriculture looks very well. *Kendall:* Planted late in October, looks remarkably well. *Lampasas:* Looking finely, an increase of acreage over last year. *Medina:* Had a fine stand, until the extremely cold weather of December, which seems to have injured it. *Red River:* But little sown and that looks unpromising on account of the freezing weather.

ARKANSAS.—*Columbia:* Less sown than usual. *Washington:* Is reduced in acreage owing to bad weather in the autumn and scarcity of good seed.

TENNESSEE.—*Coffee:* Less has been sown than for many years past. *Dyer:* Is slow in its growth; the land was well prepared and the stand good. *Fentress:* More sown than usual; the dry weather has been injurious. *Giles:* Looks remarkably well. *Hancock:* Very unpromising. *Henry:* None raised in this county. *Knox:* Looks well; does not seem injured by the extremely cold weather. *Monroe:* Promises well, though most of it was planted too late. *Rhea:* Very promising; the seed sent by the Department of Agriculture grows and looks well. *Roane:* Is looking fine and healthy. *Smith:* Has been put in much better than heretofore, though the acreage is ½ less than usual. *Wayne:* Is looking well. *Wilson:* Is promising; so far it is uninjured by the freezing cold; more than usual care was taken in preparing the ground.

WEST VIRGINIA.—*Berkeley:* Looks well. *Brooke:* More sown than usual, but owing to its being carelessly done the condition is barely an average. *Monongalia:* Did not get a good start, but looks tolerably fair. *Tyler:* Condition generally favorable.

KENTUCKY—*Boyle:* Has an increase of acreage. *Grant:* Dry and freezing weather renders the propects poor. *Hardin:* Looking unusually well. *Lincoln:* Was looking well till the late cold snap, which has injured its appearance somewhat, but it is not frozen out. *McCracken:* Looks well, notwithstanding the dry autumn. *Mercer:* Prospects fair. *Warren:* Presents a fine appearance, though only half as much as usual has been sown owing to repeated failures and the difficulty of procuring good seed.

MISSOURI.—*Atchison:* Looks well at this time. *Callaway:* Badly winter-killed. *Cape Girardeau:* Makes but little show yet; very late in planting. *Carroll:* Owing to the dry weather it was late in planting, and now looks unfavorable. *Cedar:* Hard winter on this crop. *Clay:* Has very favorable weather. *De Kalb:* Looks very badly. *Jasper:* Prospects poor; that which was sown broadcast looks as if nearly killed. *Jefferson:* Is looking well. *Livingston:* Bare ground and hard freezing are injuring this crop very much. *Macon:* Is in very poor condition, and the area sown ¼ less than last year. *Maries:* Prospects bad. *Mercer:* Has favorable weather; ground covered with snow since December 15, 1871. *Moniteau:* Looks very promising. *Oregon:* Looks bad; the weather very cold and hard upon the crop. *St. Louis:* The condition of the crop is below the average. *Vernon:* Badly frozen out; only attached to the earth by the tap-root.

ILLINOIS.—*Alexander:* Has failed to come up in many places; late planting and intense cold has been the cause; what is visible looks small and weak. *Brown:* Prospects very gloomy. *Cass:* Looks very poor, owing to the hard weather. *Champaign:* Owing to the dry and cold weather looks very unpromising. *Fayette:* Seems fair, though the winter has been severe; the acreage is larger than usual. *Greene:* Is injured by the weather. *Hancock:* Is not doing well; no snow to protect it. *Macoupin:* Has suffered from the cold weather; little snow to protect it; the top appears to be killed more than usual. *Marion:* Has been injured by the dry and cold weather. *Monroe:* Looks bad; sown late on account of drouth, though wheat sown earlier looks well. *Pike:* Looks well, but only one-fourth as much sown as usual, the autumn was so very dry. *Williamson:* Is not very promising; late plowing, continued dry and extremely cold weather have damaged the crop.

INDIANA.—*Brown:* Has not frozen out much. *Crawford:* Not winter-killed yet, and prospect is moderately good. *Dubois:* Was generally sown late on account of drought, and does not look well. *Grant:* Prospects poor. *Hamilton:* Is very short on account of drought. *Johnson:* The prospects are sad indeed. *Kosciusko:* Has been injured by the cold, dry and windy weather. *Lagrange:* Is only partially up; the weather has been very unfavorable. *Ohio:* Prospects are poor, but with little growth to stand the cold. *Owen:* Not a field in the county at all promising. *Parke:* Is in the worst condition known for at least 20 years. *Posey:* The dry, cold weather is hard on this crop. *Putnam:* Is very promising, being protected by snow during the intense cold of December. *Ripley:* Has suffered badly from the dry and cold weather. *Warren:* Prospects are unfavorable; too much dry weather.

OHIO.—*Adams:* Looking rather delicate; the growth is small. *Auglaize:* The dry autumn reduced the prospects of the crop below the average. *Carroll:* Makes a very poor show on the ground—scarcely visible; the weather has been and is unfavorable. *Coshocton:* The appearance is above the average. *Crawford:* Looking badly. *Lorain:* Looks poor, owing to the drought. *Mahoning:* Prospects good, considering the hard winter. *Morrow:* Sown early looks well; the late sown is indifferent. *Union:* Makes a poor show; dry weather and the fly have damaged it. *Vinton:* The area sown is small, owing to the drought, and the prospects are poor. *Washington:* Sown early looks well; sown late is not half up. *Wood:* Did not come up well, and looks badly.

MICHIGAN.—*Montcalm:* Never looked more unpromising than it does at this time. *Ottawa:* So far this crop has had favorable weather. *Sanilac:* The dry weather and continued cold render the prospects poor. *Shiawassee:* Looks bad. *Tuscola:* Is in very poor condition; but little top and not prepared to stand the present weather. *Wayne:* The drought prevented much of the wheat from germinating, and the intensely cold weather has been hard on that which came up.

WISCONSIN.—*Calumet:* Looking very poor. *Columbia:* The area of this crop is in

excess of any year during the past twenty years, and was in good condition when the snow fell, which now covers it to the depth of 12 inches. *Outagamie:* Looks bad; very late in being sown.

MINNESOTA.—*Sherburne*: Long-continued drought nearly ruined the crop. *Winona:* Dry weather was hard on wheat and it looks thin.

IOWA.—*Henry:* Not looking well, owing to the dry weather. *Jefferson:* An increased acreage to meet the anticipated loss from the chinch-bug. *Lee:* Has suffered considerably, there being no snow to protect it from the cold. *Marion:* Made but small growth on account of the extremely dry weather. *Polk:* Has so far wintered well.

KANSAS.—*Atchison:* Continued drouth prevented as much being sown as usual. *Bourbon:* Put in late on account of drought, and the weather is still unfavorable. *Clay:* Partially winter-killed, caused by severe weather and late sowing. *Coffey:* Very unpromising; late sowing and hard weather. *Cowley:* Looking badly, owing to the winter setting in early. *Franklin:* Less put in than usual, owing to dry weather, low price of grain, and a desire on the part of some farmers to increase the acreage of blue grass and timothy. *Johnson:* Not much sown on account of drought. *Labette:* Sown late on account of drought, then hurriedly put in, and since then, (November 18,) the weather has been severe, and the prospects are gloomy. *Lyon:* The drought lessened the acreage, and its continuance, with the intensely cold weather, prevented the crop from making much of a growth. *Marion:* The bad weather makes the crop look worse than usual. *Marshall:* Fears are entertained that the cold has killed the crop. *Miami:* Was late in being sown, and the prospects are bad. *Morris:* but little sown on account of drought. *Nemaha:* The autumn being dry, more than usual was sown, and though the growth is not large, it looks well. *Neosho:* Does not look very encouraging for a good crop. *Osage:* Is in bad condition. *Republic:* A large increase of acreage sown. *Riley:* Sown late and suffered from the freezing weather. *Shawnee:* Dry weather made it late before sowing.

NEBRASKA.—*Cass:* Looking well. *Saunders:* Looked well at the beginning of winter since then it has been covered with snow.

CALIFORNIA.—*Alameda:* There is an increase of acreage.

DAKOTA TERRITORY.—*Bonhomme:* Looked well, December 1, since then it has been covered with snow. *Lincoln*: Wheat sent by the Department of Agriculture had made its appearance, looking well when a heavy fall of snow set in. The ground is still covered.

UTAH TERRITORY.—*San Pete*: Never looked better than at this time; weather very favorable.

NEW MEXICO.—*Doña Aña:* Is sown, but only in small quantities.

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# RICE PRODUCTION.

Material misapprehension of the facts of rice production exists in the public mind. It is stated that rice culture is not extending; that it felt the effects of war's devastation less than cotton, and should therefore recuperate more rapidly; neither of which propositions is true. The rice-planters were driven from the Carolina and Georgia shores during the war, labor was in a disorganized and chaotic state, production had almost ceased; and at its close, dams and flood-gates, quarter-drains and canals, mills, barns and houses, were either dilapidated or destroyed, and the power to compel the laborers to go into the rice swamps was utterly broken. The laborers had scattered, gone into other business, and those obtainable would only work for themselves upon a share contract. Many of the proprietors were dead, and more were absentees; and inexperienced men, from the North or elsewhere, assumed their places. The rice-fields had grown up in weeds and tangled shrubbery, the labor of reparation was discouraging, and the work of cultivation was greatly increased, giving unexpected gravity to the contingencies and accidents of the season.

These difficulties have been gradually disappearing on the Atlantic coast, yet the labor question is still one of great importance. Production is increasing, regularly but slowly. The negroes are becoming accustomed to their quasi proprietorship, and with the aid of capital in

repairing works and replacing structures and machinery, and with protection against foreign competition they will utilize otherwise worthless wastes, and add millions annually to the wealth of the country.

In 1869, the crop of South Carolina, as returned by the census authorities, was 32,304,825 pounds; of Georgia, 22,277,380; of North Carolina, 2,059,281. Production had nearly ceased in 1865. The commercial returns of Carolina rice show an increase as follows: 1866, 21,031 tierces; 1867, 23,482; 1868, 37,047; 1869, 41,172. An increase was also reported in 1870, but the season of 1871 was unpropitious, and the record may show a decrease.

Dr. J. J. Waring, of Savannah, gives local figures illustrating the rate of increase as follows: 1866, 12,500 casks; 1867, 24,337; 1868, 30,795; 1869, 60,146; 1870, 67,736.

In Georgia, two-thirds of the rice is grown in Chatham and Camden Counties; half in the vicinity of Savannah. In South Carolina, nearly half of the crop is grown in Georgetown. The following figures show how small a district yielded the rice of the palmy days of 1859:

| South Carolina. | Pounds. | Georgia. | Pounds. |
|---|---|---|---|
| Georgetown | 55, 805, 385 | Chatham | 25, 934, 160 |
| Colleston | 22, 838, 984 | Camden | 10, 330, 068 |
| Charleston | 18, 899, 512 | McIntosh | 6, 421, 100 |
| Beaufort | 18, 790, 918 | Glynn | 4, 842, 755 |
| Total | 116, 334, 799 | Total | 47, 528, 083 |
| Twenty-four other counties | 2, 765, 729 | Eighty-eight other counties | 4, 979, 569 |
| Total | 119, 100, 528 | Total | 52, 507, 652 |

But the extension of rice culture in Louisiana is a triumphant refutation of the baseless assertion that the business cannot prosper under the most favorable present circumstances. The census exhibits it as follows: 1849, 4,425,349 pounds; 1859, 6,331,257 pounds; 1869, 15,854,-012 pounds. The record of M. Bouchereau, by plantations, accounts for a total crop in 1869 of 100,748 barrels of 200 pounds each, or 20,149,600 pounds. The crop of 1870 was not a successful one. In 1859 Plaquemines Parish yielded 4,635,500 pounds of the crop of 6,331,257 pounds, or about two-thirds of the total product of the State; in 1869 the same parish produced 6,247,400 pounds, (record of Bouchereau,) and yet it was less than a third of the crop of the State, and returns were made from 14 other parishes.

The following is the census exhibit of rice production at three decennial periods:

| States. | 1870. | 1860. | 1850. |
|---|---|---|---|
| | *Pounds.* | *Pounds.* | *Pounds.* |
| Alabama | 222, 945 | 493, 465 | 2, 312, 252 |
| Arkansas | 73, 021 | 16, 831 | 63, 179 |
| California | ..... | 2, 140 | ..... |
| Florida | 401, 687 | 223, 704 | 1, 075, 090 |
| Georgia | 22, 277, 380 | 52, 507, 652 | 38, 950, 691 |
| Kentucky | ..... | ..... | 5, 688 |
| Louisiana | 15, 854, 012 | 6, 331, 257 | 4, 425, 349 |
| Mississippi | 374, 627 | 809, 082 | 2, 719, 856 |
| Missouri | ..... | 9, 767 | 700 |
| North Carolina | 2, 059, 281 | 7, 593, 976 | 5, 465, 868 |
| South Carolina | 32, 304, 825 | 119, 100, 528 | 159, 930, 613 |
| Tennessee | 3, 359 | 40, 372 | 258, 854 |
| Texas | 63, 844 | 26, 031 | 88, 203 |
| Virginia | ..... | 8, 225 | 17, 154 |
| Michigan | ..... | 716 | ..... |
| Minnesota | ..... | 3, 286 | ..... |
| Total | 73, 635, 001 | 187, 167, 032 | 215, 313, 497 |

The following statement of exports and imports of rice has been furnished by Edward Young, Chief of Statistics in the Treasury Department:

| Years. | Domestic exports. | | | |
|---|---|---|---|---|
| | Tierces.* | Barrels.† | Pounds. | Value. |
| 1850 | 127,069 | ..... | 76,241,400 | $2,631,557 |
| 1851 | 105,590 | ..... | 63,354,000 | 2,170,927 |
| 1852 | 119,733 | ..... | 71,839,800 | 2,471,029 |
| 1853 | 67,707 | ..... | 40,624,200 | 1,667,658 |
| 1854 | 105,121 | ..... | 63,072,600 | 2,634,127 |
| 1855 | 52,520 | 19,774 | 39,421,600 | 1,717,953 |
| 1856 | 58,668 | 81,038 | 67,616,000 | 2,390,233 |
| 1857 | 64,332 | 74,309 | 68,322,800 | 2,290,400 |
| 1858 | 64,015 | 49,283 | 58,122,200 | 1,870,578 |
| 1859 | 81,820 | 69,946 | 75,070,400 | 2,207,148 |
| 1860 | 84,163 | 77,837 | 81,632,600 | 2,567,399 |
| 1861 | 39,162 | 50,038 | 43,512,400 | 1,382,178 |
| 1862 | 2,146 | 7,335 | 4,221,600 | 156,899 |
| 1863 | 494 | 3,496 | 1,694,800 | 83,404 |
| 1864 | ..... | 5,442 | 2,176,800 | 84,217 |
| 1865 | ..... | 2,458 | 983,200 | 65,105 |
| 1866 | ..... | ..... | 2,212,901 | 136,993 |
| 1867 | ..... | ..... | 1,394,007 | 100,338 |
| 1868 | ..... | ..... | 3,079,043 | 170,357 |
| 1869 | ..... | ..... | 2,232,833 | 145,934 |
| 1870 | ..... | ..... | 2,133,014 | 127,655 |

| Years. | Foreign exports. | | Imports. | |
|---|---|---|---|---|
| | Pounds. | Value. | Pounds. | Value. |
| 1861 | 348,900 | $10,856 | 148,550 | $3,610 |
| 1862 | 2,339,146 | 103,738 | 56,961,317 | 1,589,109 |
| 1863 | 7,844,068 | 392,134 | 61,196,740 | 1,760,077 |
| 1864 | 7,637,635 | 452,722 | 99,691,447 | 1,911,330 |
| 1865 | 8,290,318 | 559,465 | 60,407,756 | 1,474,393 |
| 1866 | 8,656,060 | 337,016 | 76,209,397 | 2,379,857 |
| 1867 | 4,676,082 | 180,043 | 44,782,223 | 1,219,387 |
| 1868 | 11,908,953 | 403,941 | 59,140,707 | 1,636,492 |
| 1869 | 8,868,664 | 284,632 | 54,065,191 | 1,325,234 |
| 1870 | 15,212,833 | 454,316 | 43,123,939 | 1,007,612 |

* Estimated at 600 pounds each. † Estimated at 400 pounds each.

In conclusion, these are the facts: The culture of rice is rapidly extending in Louisiana, and may be extended to nearly every parish in the State; it is slowly but surely overcoming its serious hinderances on the marshes of the Atlantic coast; it is mainly carried on by negroes on their own account, as a business in which they have had a life-time training, and its destruction would therefore be a serious calamity to a needy but industrious class of our population; and there is no reason why the home supply of rice should not soon be met without importation. It must be deemed an absurdity, if not a disgrace, for a country like ours to assume the necessity of importing cereals or bread-stuffs in any form.

## PROGRESS IN THE BEET-SUGAR MANUFACTURE.

Experiment in the manufacture of beet-sugar in this country is assuming a more systematic and practical form, overcoming many if not all the difficulties confronting profitable production, and apparently laying the foundation for a great industry. It would seem that the

probable future of the business of making beet-sugar must depend mainly on the comparative profit of beet and cane-sugar. The difficulty in the high price and unskilled quality of available labor will ultimately be overcome.

The first large experiment, at Chatsworth, Illinois, was a disastrous failure, financially, from miscalculation, lack of skilled labor, unsuitable soil for the growth of the sugar-beet, and a scarcity of water; yet the sequel of this enterprise, at Freeport, Illinois, with a portion of the same machinery, under different auspices, and with the lessons of the failure well learned, promises successful results. It was under the direction of Mr. Rosentiel; and Mr. Bunn, one of the Chatsworth owners, and J. I. Case, are associated with him in the proprietorship. The location, on Yellow Creek, which furnishes an unfailing supply of pure water, is said to be a good one; and the soil appears to be well adapted to beet culture. We have had no statement of the results of recent work, but have learned that Mr. R. is confident of full success, and of a large extension of business in that vicinity. A dozen factories in the neighborhood, which would mark the locality as a sugar manufacturing section, would intensify greatly the force of the example, and would illustrate far more conspicuously the auxiliary advantages of such an industry to agriculture.

The co-operative enterprise at Black Hawk, Wisconsin, which commenced in 1870, under difficulties, and made 40,000 pounds of sugar, cultivated 200 acres of beets in 1871, and is pushed with a determination deserving of success.

The most successful results as yet have been obtained in California, where two companies are in operation, one producing more than a million pounds of sugar from the crop of 1871, the second year of its operations. This is the California Beet-Sugar Company at Alvarado. The Sacramento Valley Beet-Sugar Company, at Sacramento, also reports comparatively successful results. The San José enterprise is not yet in operation. Mr. S. O. Minor, the secretary of this company, writes that "owing to the fact that we found it impossible to procure a sufficient quantity of the proper seed to start the business, the company could not proceed as contemplated, and we have deferred the organization until sufficient seed can be raised among our farmers here. We managed to procure about two hundred pounds of the seed of the White Silesian, (said to be the best,) which was distributed here, and from which we hope next year to have enough seed to start the business."

The following statement has been communicated by Mr. A. D. Bonesteel, manager of the California Beet-Sugar Company, located at Alvarado:

In the year of 1869 my partners, Mr. A. Otto and E. Klineau, both experienced sugar men, and myself, were successfully engaged in Fond du Lac, Wisconsin, making beet-sugar on a small scale, and for the want of more capital I communicated my ideas as to the feasibility of doing the same in this State to General C. I. Hutchinson, of San Francisco, who at once formed a company with a capital of $250,000, and the result to-day is a factory in Alvarado, in *successful operation*, having the capacity for handling sixty tons of beets every twenty-four hours, and we have the satisfaction of knowing that we have established the fact that beets can be raised in Wisconsin and California containing saccharine matter in sufficient quantities to justify a remunerating price to the farmer for raising and delivering them at the factory, and a margin for profits for the manufacturer.

With respect to the best variety of beets, yielding the most sugar, I should name the White Silesian. For the manufacture of sugar the smaller beet, of which the roots weigh from one to three pounds, are preferred.

The seed is sown by a machine that we manufacture ourselves, which sows four rows at a time. The rows are fifteen inches apart, and when the plant first comes up, we

hoe the rows to keep the weeds down, and then thin out the plants so as to leave the plants eight inches apart. They will then stand in the rows eight inches by fifteen.

Though most countries and climates permit the culture of the sugar-beet, there is of course a choice of soil, if the highest development of saccharine qualities is desired. The root of the sugar-beet penetrates deeply into the ground, and always flourishes best in a deep, rich, loose, mellow, warm, and fertile soil, free from saline and alkaline constituents, not sour, and of a nature little liable to suffer from drought.

The yield per acre, on the average, has been about fifteen tons, although in some cases it has run as high as twenty tons; last year we raised thirty-one hundred tons of beets, and manufactured about five hundred thousand pounds of sugar, and this year we shall make over one million pounds of sugar from the crop of beets that we have raised.

The beet-sugar business in the United States is still in its infancy, and with proper encouragement there is no doubt it can be made one of the best industrial interests we have, as a factory of the capacity of ours gives employment to a large number of hands in the culture and manufacturing the beet into sugar. We are at the present time feeding three hundred and fifty head of cattle from the pulp for the San Francisco market.

If the manufacture of beet-root sugar can be successfully prosecuted in any part of the United States, we claim that it can be done in California. We have the soil and climate, to which we need only add economic labor and experienced men in the business, and the thing is done.

Mr. S. Ehrenstein, superintendent of the Sacramento Valley Beet-Sugar Company, communicates the following facts:

The crop of beets has been very light on our grounds, owing to wrong cultivation. My arrival here in April was too late to enable me to remedy things. We have harvested about 2,000 tons of beets, part of which are, however, not of proper quality for the manufacture of sugar. The extraordinary drought prevented growth; some were quite dried out. The good beets showed, in July, 12 per cent. of sugar, and average now from 13 to 14 per cent. Exceptions show 16 to 18 per cent., which is a great deal more than is ever found in the beets of Europe. By cultivating early, and in the proper manner, I hope to get a good and sure crop for next year, and altogether my short experience here encourages me to entertain the most favorable expectations for the beet-sugar industry in California, provided that the Government continues to protect the industry. The great drawbacks are the extraordinary wages paid here for work and the high prices of fuel and freight.

The factory is furnished with Roberts's diffusion apparatus, well known in Europe to be the best method of extracting sugar. The machinery has been partly imported, because the manufacturers here have no knowledge of sugar machinery. The factory had already been in operation, but in consequence of the peculiar relations with the workingmen, and their want of experience in this industry, great difficulties had to be overcome. After several trials, sixty tons of beets were worked up in twenty-four hours, and the result was satisfactory. The sugar is quite white, without any taste of beets, and can be sold as readily as the best cane-sugar. We sell only two kinds for consumption, A and B; the colored second produce is worked over again.

The beets have been raised from German and French seed. The former is preferable for this country, because the beets grow downward into the ground, and do not show any green tops. It is the White Silesian beet. Double the quantity of seed is needed here per acre that is required in Europe, because a great deal of it does not come up, in consequence of the bad cultivation of the ground. The outlay is consequently very heavy, and cheap importation an important item. A sandy loam, with moist sub-soil, is the best here for beets; better than a heavy soil, which is often saltish, or has water-tight layers of clay under it, shutting off the water, and causing the beets to dry.

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# THE POTOMAC LANDS.

The central location of the lands of Northeastern Virginia, the wonderful facilities afforded for water communication with the principal cities, their climatic advantages in fruit-growing through the modifying influences of large bodies of deep water, and the variety found in the soil itself, contribute materially to a true estimate of their intrinsic value, which will only become fully apparent when improvement shall have unfolded something of their real capabilities. The abundance of sea-

weed on the shores, the plentiful supply of material for home-made fish-guano, the cheapness of oyster-shell lime, and the underlying marl so accessible through all this region, offer fertilizers in great variety and practically unlimited quantity, precluding the necessity of the more costly commercial fertilizers, and enabling the farmer to increase at will the fertility of his lands.

People begin to think that it may be poor economy to grow corn at ten cents per bushel on cheap western lands—say eighty bushels for $8—when lands might be had at $30 to $50 per acre, in some places for $10 to $20, that will produce fifty bushels, worth $40. The soil is generally a loam; in some places a sandy loam of fine texture and full of organic matter; in others, a clay loam, retentive of moisture and of manure. It is a light, quick soil, which literally shoots into perfection all sorts of products. The climate is propitious, giving earlier results by from two to four weeks than Delaware and New Jersey. This fact, connected with that of remarkable facilities for cheap and rapid communication to Baltimore and the more northern cities, makes this region the paradise of "truck" growers. The same cheapness of transportation gives value to the timber, much of which is heavy, making cord-wood, formerly a drug not worth marketing, a valuable commodity.

We refer to a record of a visit once made to a tract which may be taken as a sample of these Potomac lands:

Very little expense has been incurred for fertilizers. Twenty bushels per acre of cheap gas lime had been spread upon the grass land, and the crop is evidently fairly estimated at two and a half tons per acre. The corn was planted late, but its germination and growth have been marvelous. The soil is a fine clay loam, in some places with more of silex, never stiff and heavy, and never inclining to "bake" under the influence of heavy rains and hot sun. A little further on, on the lightest soil to be found, are peach trees, put out four years ago, large enough for six years growth, perfectly healthy and vigorous, and full of fruit. In the distant wood is one of those blemishes upon Virginia agriculture, an old field, exhausted and abandoned. Examination reveals the fact that the exhaustion is skin deep; the surface had been scratched over, in former years, and spitefully turned out to grass and weeds, upon refusal to yield undiminished returns with so negligent culture. The soil immediately below the surface has long been unstirred. It contains in a fair degree the elements of fertility, and the subsoil differs little in appearance, being a little more crude, uninfluenced as it is by air and frost. An inch or two deeper plowing, and a little lime to correct its acidity, would make it comparatively a productive soil, and a green manuring of clover would make it better still. For fruit, sweet potatoes, melons, and market gardening generally, it would produce largely. For grass it is scarcely surpassed, in quantity or quality. Wheat yields a valuable crop, and corn grows luxuriantly.

The following letter from Mr. Chalkley Gillingham, of Accotink, Virginia, a pioneer in the development of the capabilities of these soils, in a colony upon a part of the original estate of General Washington, in the vicinity of Mount Vernon, gives a brief statement of the results of that enterprise:

In the latter part of the year 1846, four or five others besides myself purchased the "Woodlawn" estate, (a part of the original Mount Vernon) then a neglected estate of 2,000 acres. There was not one white person upon it. Our intention was to form a settlement of people alike in habits and sentiments. Others were expecting to join us in the experiment. The first thing we did after the purchase was to come down to the property and bring a surveyor with us, and we laid off the whole into lots of 50 to 150 acres each. There was a very large substantial brick mansion-house on the premises, tenantless. We set off 400 acres with the mansion-house, the balance in small tracts; half of the whole estate was in timber. We introduced farmers, mechanics, and laborers. Four of us joined together in copartnership, built a large saw-mill, and repaired an old flour-mill on an adjoining property, which we bought within the first year, and commenced sawing up the timber and grinding grain. The timber went to Philadelphia, Bath, Maine, and other places; the flour, after supplying the colony, went to Alexandria and Washington, and the North. Our mills were at the mouth of Accotink Creek, at tide-water, where vessels could load at the mill. A few of the other members of the colony took small farms to themselves; the remander of the land for the time being was worked

and improved by the four who were associated together and who were owners of the main part of the estate, from which lots were sold off as fast as settlers came in; the whole estate is now worked in small farms. The 400 acres left with the mansion-house is now divided into five or six lots or farms. We commenced our farming improvements by moderately deep plowing, thoroughly done, using guano freely as a fertilizer to commence with, in order to get straw and other vegetable matter with which to make other fertilizing materials to follow. But we find lime to be the cheapest and most enduring fertilizer we can employ, after getting vegetable matter into the soil. Our general farming is a rotation of corn, potatoes, or oats, and wheat, then grass, which latter, with corn, are the principal crops. We have considerable land devoted to small fruits and orchards and nursery, which we find more profitable hereaway than general farming. While a crop of wheat will only yield 15 to 30 bushels to the acre, worth $1 to $1 50 per bushel, or $30 to $40 per acre, a crop of strawberries, or other small fruits, will yield from $100 to $250 per acre. Orcharding I consider to be profitable. We have many hundred apple and peach trees. The apple orchards are most of them too young to show what is the best they can do, but, from our experience thus far, I believe apple-raising will be quite remunerative. The fruit in most instances is very fine. I have examined, studied, and experimented much the past twenty-five years to ascertain the kinds best adapted to our climate, soil, and other circumstances, and think I have succeeded with a list sufficiently large for all practical purposes. The people of this region have been heretofore misled, particularly with winter or long-keeping varieties, having obtained their trees from the North and planted such varieties as are popular there, (and the fruit from which they have eaten here imported from there,) which has proved a failure when grown here. We find varieties originating here and south of us to be the proper varieties for long keeping; we therefore obtain such varieties from trees originating here, and in North and South Carolina and Georgia, such as the Abram, Milam, Limbertwig, Rawle's Janet, Prior's Red, Meade's Keeper, and Boling's Sweet, of Virginia; the Wine-Sop and York Imperial, of Pennsylvania, have an equally high meed of praise; the Cullasaga, of South Carolina, and several others of less note, and still less known, of North Carolina and Georgia. Last, not least, is pear culture, which succeeds most admirably in our soil and climate; and the old varieties, which seem to have run out as by exhaustion in more northern latitudes, succeed here to admiration. I will give you a list of such as I find to be very desirable, viz: Bartlett, Seckel, White Doyenne, (Butter, Virgalieu, St. Michael's, of the North,) Duchess d'Angoulême, Louise Bonne de Jersey, Flemish Beauty, Buerre de Anjou, and many others of nearly the same claims for superiority.

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# SWAMP-LAND RECLAMATION.

The work of reclaiming overflowed or swamp lands is progressing in California. A mine of wealth is opened in such improvements, by which lands obtained at the average rates of Government sales of public lands of all grades are transformed, at an expense usually not exceeding five dollars per acre, into the richest and most manageable of tillable areas, having the added advantage of almost perpetual sunshine above, and a never-failing supply of water beneath, securing results in production almost unexampled. Information has been received of the organization of a company of San Francisco capitalists who have purchased 40,000 acres at the northwest end of Lake Tulare, in Tulare County, at $2 50 per acre, and will immediately inaugurate measures for its reclamation. Negotiations for 25,000 acres adjoining are also in process.

Marsh and tide lands in Alameda have been sold to the value of $40,086. The overflowed lands on the eastern shore of San Francisco amount to 20,000 acres.

In Contra Costa County, on the south bank of the west channel of San Joaquin River, a strip of low lands 25 miles long, requiring a levee only on one side, contains 15,000 acres, valued at $100 per acre. On a portion of this tract 25,000 sheep have been grazing; another portion (of 10,000 acres) has pastured 11,000 head of cattle, and weekly shipments of beeves have recently been made from it to San Francisco. It is believed there that six to nine tons of lucern can be produced per

acre on this land. On 5,000 acres it is proposed to grow a crop of wheat the coming season. These tule lands are prepared for culture by burning. The tule and grass are set on fire and rapidly consumed, and the soil itself is burned to ashes to a depth at which the fire is checked by moisture, leaving several inches of light ashes and charred soil on the surface. The level of the land is often lowered by this process from four to six inches. No cultivation is required, but the seed is sown on the surface, and the harrowing is accomplished by turning on a flock of sheep, which is subdivided into sections of 200 to 300 each, and driven systematically, each by a boy and a shepherd's dog, until the ground has been thoroughly tramped over. In harvesting, there is too much grain left upon the ground for seed; so the sheep are again brought into requisition to feed upon a portion while they tramp in the remainder.

Twitchell Island, south of Brannan Island, containing 3,600 acres, was leveed in 1870, but not in season to dry it in readiness for burning, with the exception of 1,000 acres, which were sown in wheat. The product of that wheat crop is reported at $67,700, which is just $300 less than the purchase-money for the whole island. Besides the wheat, vegetables to the value of several thousand dollars were grown upon the same tract. A large area in the center of the island has been burned, preparatory to seeding and tramping, while sheep are fattening upon the wasted grain left upon the area in wheat in 1870.

On Sherman Island, the reclamation of which has been heretofore reported, immense crops are now grown. One field in 1871 is said to have yielded 60 bushels of barley per acre, and afterward two crops of Chili clover one and a half tons each per acre. Another field, according to the report, brought 45 bushels of wheat per acre, one and a half tons of clover, and feed for cattle in the autumn.

The number and character of these enterprises are worthy of special investigation. Some companies propose to reclaim very large areas, in one case about 80,000 acres. After reclamation these tracts are cut up and sold, sometimes in bodies of hundreds of acres, often in small farms, the lapse of time promoting further subdivision, which will ultimately secure a dense population and the highest culture.

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## DEPARTMENT BULLETIN.

A convention of delegates, representing the interests of the State agricultural and horticultural societies, boards of agriculture, and agricultural colleges of the United States, will meet at the city of Washington, on Thursday, the 15th of February next, to confer upon subjects of mutual interest, and to take such action as shall be deemed expedient for the promotion of agricultural education, and to secure a more intimate connection between the Department and the several institutions mentioned. The meeting will take place in one of the rooms of the Department building, at 10 o'clock in the morning. The call for this convention was issued by the Commissioner of Agriculture after a full interchange of views with officers of agricultural colleges, and with other prominent agriculturists.

The Department is now receiving, principally for distribution to the South, in liberal portions, for experimental purposes, improved varieties of field and sugar corn, field and garden peas and beans, Italian rye-grass, *Bromus Schraderi*, and lucerne; mangel-wurzel and sugar-beet,

cabbage and onion seeds. It will also receive, during this month, fresh seeds of the ramie and jute plants, the latter of which cannot be grown successfully north of Tennessee. Oats and barley of approved varieties have been ordered from Scotland and Germany, and will be distributed in ample time for spring-sowing. A choice variety of white spring-wheat, grown in Oregon from seed imported from Australia, has just been distributed to the Northwestern States and Territories.

The Department has also just distributed a quantity of Cooley's early white field-corn to a selected list of farmers in the different States, who will make a trial of it in their respective localities, and report the results of their experiments at the close of the year. This corn is a new variety, originated by Mr. C. C. Cooley, of Manchester, Adams County, Ohio, and introduced to the public in the fall of 1870. It is said to be remarkable for its early maturity. Mr. Cooley states that he planted it the past season on the 3d of May, and it was ripe and ground into meal the 9th of August, the time of its growth having been fourteen weeks. A farmer in Wisconsin is reported to have raised a crop and had it ground into meal in thirteen weeks from the day of planting. Another, in Minnesota, raised fifty bushels from one pint and a half of seed. Mr. Cooley claims that this corn is equal in productiveness to any variety in cultivation.

As there is much inquiry in the Southern States for seed of the Japan clover, it is deemed proper to republish, from the Annual Report for 1869, the following opinion by the Superintendent of the Garden and Grounds of the Department: "*Lespedeza striata* (Japan bush-clover) is a leguminous plant that has lately attracted some attention in the Southern States as a forage plant. It is poorly adapted to any such use, and not by any means worthy of recognition by the cultivator. It is a low, hard-wooded annual, spreading freely on sandy and poor soils, with very small and scanty foliage."

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## CHEMICAL NOTES.

Dr. Ryland T. Brown has been appointed chemist of the Department of Agriculture, and entered upon the discharge of his duties, January 11. He has not had sufficient time to make any extended chemical analysis, and therefore has no report to present this month. He found the laboratory in charge of an assistant, Mr. Henry M. Smith, who presents the following notes of his analysis of yaupon (*Ilex cassine*) or Carolina tea. This plant is of special interest to the people of the United States, as it belongs to the family which is, chemically, the American representative of the tea of Asia and the coffee of Africa.

### REPORT ON YAUPON.

The Department is indebted to Mr. J. E. Reside, of Washington, District of Columbia, for the opportunity of analyzing a specimen of this interesting plant. "Yaupon" was the name given by the Indians to the leaves of the *Ilex cassine*, which formed an important article of commerce between the different tribes. Mixed with the leaves of other species of the same plant, (*Ilex vomitoria*, Aiton, and *Ilex dahoon*,) it formed the basis of their famous "black drink," which was used by them as a medicine; and at one of their peculiar religious festivals was taken, a pint at a time, at short intervals during two or three days, to serve as an emetic, to thoroughly purify their bodies before undertaking one of their protracted expeditions. The emetic effects were more probably due, how-

ever, to the large quantities of the very strong and bitter decoction than to any peculiar active principle contained in the yaupon, for strong black tea will sometimes produce the same effect under similar circumstances. Yaupon is found along the coast of the Southern States, from Florida to North Carolina; it is not known to grow in the interior.

The specimen received for analysis weighed about half a pound, and was apparently composed of the dry and broken leaves, and small twigs of the plant. The preliminary analysis gave:

| | |
|---|---|
| Moisture, (determined at 140° C. in an atmosphere of carbonic acid) | 7,595 |
| Organic matter | 88,470 |
| Ash | 3,935 |
| Total | 100,000 |

Treated with the usual solvents, it yielded the following results:

| | |
|---|---|
| Soluble in ether | 6.96 |
| Soluble in alcohol and insoluble in water | 4.84 |
| Soluble in cold water and insoluble in alcohol | 8.24 |
| Soluble in both alcohol and water | 10.15 |
| Soluble in hot water containing 5 per cent. hydrochloric acid | 15.28 |
| Insoluble | 46.93 |
| Moisture | 7.60 |
| | 100.00 |

The more important proximate principles having been separated and weighed, the following percentage of each was obtained:

| | |
|---|---|
| Volatile oil | 0.011 |
| Wax and Fat | 0.466 |
| Resin | 3.404 |
| Chlorophyll | 2.491 |
| Caffeine, (Theine) | 0.122 |
| Tannic acid | 2.409 |
| Coloring matter, etc., soluble in alcohol, insoluble in water | 4.844 |
| Extractive matter, insoluble in alcohol, (Gum, Pectin, etc.) | 8.244 |
| Extractive matter, soluble in both alcohol and water | 10.149 |
| Starch, Pectose, Tannin, etc., soluble in hot dilute hydrochloric acid | 15.277 |
| Nitrogenous matter, insoluble in water, (probably Legumin, combined with Tannic acid) | 8.138 |
| Woody matter | 34.854 |
| Moisture | 7.595 |
| Ash | 3.935 |
| Total | 101.939 |
| Nitrogen | 1.302 |

The volatile oil has a very agreeable odor, faintly resembling that of raw tobacco, but having also a tea-like smell. The small quantity of yaupon available for analysis, prevented any extended examination of the physical characteristics of this oil. It was apparently quite soluble in water, and a quantity scarcely weighable gave an agreeable odor to a large volume of that liquid.

The large percentage of resin is worthy of attention, as it is probably derived from the oxidation of the volatile oil, and it suggests that the aroma and medicinal properties of the tea might be improved by a more careful preparation of the leaves. The large amount of woody matter, derived from the small twigs, etc., confirms us in this opinion.

The amount of caffeine (the alkaloid of coffee and tea) is not large, ordinary Chinese tea containing from 2.5 to 6 per cent. Paraguay tea (*Ilex Paraguayensis*) contains, according to Stenhouse, 0.13 per cent. of caffeine, which is almost precisely the same amount as was found in

yaupon. In the extraction of the volatile oil; by boiling the substance with water, and extracting the oil from the distillate with ether; a trace of caffeine was found with the oil; proving that this alkaloid is carried off mechanically when tea or coffee is boiled.

The percentage of tannic acid only includes that dissolved by ether; another portion exists in the insoluble residue, probably combined with legumin.

Yaupon is used by many persons in the South as a stimulant and as a substitute for intoxicating liquors; and it is also said to be very grateful to inebriates who are curing themselves of their love of liquor.

As the physiological effects of tea and coffee are due to the joint action of the volatile oil, caffeine, and the tannin which they contain, it may be well to compare the percentages of these substances found in yaupon, with the results obtained by other chemists in their analyses of tea and coffee:

| | Yaupon. | Maté, or Paraguay tea. | Black tea, average. | Green tea, average. | Green tea. | Coffee. |
|---|---|---|---|---|---|---|
| | | Stenhouse. | Mulder. | Mulder. | Peligot. | Payen. |
| Volatile oil | 0.01 | ..... | 0.63 | 0.88 | 0.50 | 0.003 |
| Caffeine | 0.12 | 0.13 | 0.56 | 0.52 | 6.00 | 1.00 |
| Tannin | 2.41 | ..... | 2.04 | 17.68 | 14.00 | 10.00 |

By comparing these figures it will be evident that yaupon is about equal to maté (Paraguay tea) in the amount of caffeine which it contains, and that it is far below either tea or coffee in its percentages of valuable constituents.

It is very probable that several other indigenous plants may contain caffeine—for example, common holly, the black alder, and the "inkberry" plant—and it is proposed to test these as soon as proper samples can be secured.

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# ENTOMOLOGICAL RECORD.

DESTRUCTIVE GRASSHOPPERS IN CALIFORNIA.—A letter written in June, 1871, from Mr. Alexander S. Taylor, of Santa Barbara, California, giving a very interesting account of the ravages committed in that State by the Pacific migratory locust or grasshopper, which he erroneously supposed to be merely a variety of *Caloptenus spretus*, (Uhler,) but which has been decided to be *Œdipoda atrox* of Scudder, (Fig. 1,) by Rev. Cyrus Thomas, who has made this family his especial study. Mr. Taylor writes that "this year the insect appeared simultaneously in the Salinas, San Joaquin, Los Angelos, Sacramento, and Santa Barbara Counties, in May and June." In Mr. Scudder's notes on the *Orthoptera* collected by Hayden's Geological Survey in Nebraska, we find the species mentioned and described, and in the same article Mr. Scudder gives quotations from Mr. Taylor in the Smithsonian Report for 1858, and from the California Farmer, of January 15, the same year, from which it appears that the insect was exceedingly numerous and destructive before the present season. In July, 1865, the Sacramento Union stated that for

Fig. 1.

about three hours in the middle of the day the air, at an elevation of about two hundred feet, was literally thick with them and great numbers fell in the streets, absolutely taking the city by storm; they then commenced their wholesale destruction of everything green in the neighborhood, and their flight en masse resembled a thick snow-storm, and their depredations the sweep of a scythe. In the year 1855, in the North Sacramento Mountains they are said to have been "as thick in the heavens as flakes of snow in a wintry storm," and in the Sacramento Valley, "whole orchards, gardens, and vineyards were consumed by them; entire fields of young grain, of crops, and vegetables, were eaten up within the space of a single day, leaving the ground like a wilted, blackened desert, and, in some parts of the valley, they annoyed the passengers and horses of the public stages to such an extent as to cause the greatest inconvenience, and appear, in some cases, to have positively endangered human life."

A gentleman residing in Colusa County, in the Sacramento Valley, in the summer of 1855, informed Mr. Taylor, "That these insects appeared to rise out of the eastern boundary of the valley, where it is hot, dry, and sandy, and that on some days they filled the air so as to obscure the sun; they consumed all garden vegetables, the leaves and bark of the elder tree, and the young leaves and bark of the small branches of cottonwood, willow, and even the soft green parts of the tules or bulrushes in Stony Creek. In Colusa County their dead bodies were seen, at one time, completely covering the surface of the water for miles in extent. In some parts of the valley they ate through gauze and textile coverings of all kinds, which had been used to shield animals and plants from their attacks."

From Mr. Taylor's account in the Smithsonian Report for 1858, it appears that there are at least three species of grasshoppers or locusts, in California and Oregon, which are very injurious to the crops, but as there are no names or accurate descriptions given, it is extremely problematical which of them it is that does the most injury. At the same time his letters were written to the Department, however, he sent two bottles of the insect figured (see Fig. 1) as specimens of the grasshopper he wrote about, and named them the Pacific Migratory Locust, and he says it is undoubtedly an indigenous species, as it was known to the early colonists and missionaries as far back as 1730.

Fig. 2.

This grasshopper, or locust, is a little over an inch in length; is of a pale brownish yellow color, with several small, roundish, brown spots, and a large brownish mark on the upper wings, and a dark fuscous spot behind the eye. It bears a very strong resemblance to *Œdipoda pellucida* (Scudd.) of New England. Indeed had these locusts not come from California direct, and from good authority, they might readily have been mistaken for the last-named insect. It does not appear that any steps have yet been taken to destroy these insects in California, but the same remedies used for destroying the *Caloptenus spretus*, (Uhler,) or hateful grasshopper, might be adopted. It is of great importance to find out where they live when young and in the wingless state, as it is at this time—or when in the egg, just below the surface of the earth—that they may be destroyed most readily.

There are three grasshoppers or locusts very similar in size and form, now known greatly to injure the crops in the United States, and we give figures of them all in order that our readers may be able to recognize them. First is the *Caloptenus spretus*, Uhler, (Fig. 2,) or western species, (Agric. Rept. 1870, p. 76,) commonly known as the hateful grasshopper, and found in the States west of the Mississippi, and in the Rocky Mountains, in immense swarms, and which is distinguished by its length of wing from the second, or common eastern species, *Caloptenus femur-rubrum*, Har., (Fig. 3,) the red-legged grasshopper, which has shorter wings, but otherwise is almost identically the same as the above; and lastly, *Œdipoda atrox*, (Scudd.,) the Pacific species mentioned, and figured at the beginning of this article.

Fig. 3.

A NEW REMEDY.—Theodore Day writes to the Department as follows:

> The striped cucumber beetle (*Diabrotica vittata*, Fab.) did not trouble me much last spring, but, after frost killed the vines, I noticed plenty of them on the soft pumpkins, and went round and killed them. If they gather so every fall, I think it would be a good plan to leave a few soft pumpkins, and then go around every pleasant day and destroy the insects collected upon them.

Might not this plan work to advantage with the common squash-bug, *Gonocerus tristis?* It is at least worthy a trial.

EGG-PLANT PESTS.—Dr. E. Foster, of Louisville, Mississippi, sends a number of insects, which he complains of as very injurious to egg-plants. It proves to be one of the blister-flies, *Epicauta marginata*, (*cinerea* of Lec.,) which feeds upon the foliage of butter-cup, potato, &c., but it has never before been accused of injuring egg-plants.

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## SCIENTIFIC NOTES.

ABSORPTION OF MOISTURE BY LEAVES.—Mr. M. Cailletet has lately been investigating the question as to whether the leaves of plants are capable of absorbing water in a liquid state; and sums up the result of his experiments, by stating that the fact seems to be demonstrated that a plant growing in a humid soil and receiving by its roots the quantity of water necessary to its normal condition, does not absorb the water which moistens its leaves, but that such absorption takes place as soon as the leaves begin to wither, in consequence of the dessication of the soil. In this way he explains the phenomenon of certain plants maintaining a healthy condition without any contact with the soil, and even absolutely isolated from all assimilable substances. Thus, a specimen of *Pourretea* a rootless Bromeliaceous plant, maintained a healthy existence and exhibited considerable increase in weight, while suspended for more than six years in the air by a wire. No moisture ever reached it except that from the garden syringe, and yet it was continually putting out new leaves and flowering abundantly.

COMPOSITION OF THE ALBUMEN OF EGGS.—The albumen of the white of egg has lately been shown to consist of two distinct varieties; one having its maximum point of coagulation at 63°, the other at about 74°. In addition to these there is a case in substance, one known

as lactoprotein. According to Gautier, when albumen of egg is treated with water at 150°, it yields the following products, which pass through a dialysis, besides insoluble matters: 1. Substance having the properties of casein; 2. A substance analogous to hypoxanthine; 3. An albuminoid substance.

USE OF CAUSTIC BARYTES IN SUGAR-REFINING.—Dr. George Lunge publishes in Dingler's Polytechnic Journal an account of his method of using caustic barytes for the separation of the sugar from molasses in the sugar-refinery; this, in his view, being one of the best methods known, since it forms an insoluble combination with the sugar, which can be again decomposed, by means of carbonic acid, into insoluble carbonate of barytes and soluble sugar. The details of the process are too technical for our columns; but this reference to the article may be of service to some of our readers.

DESTROYING MOLD IN CELLARS.—According to Dr. Wiedehold, fungus growths in cellars may be combated either by burning sulphur or by pouring two parts of concentrated sulphuric acid over one part of common salt. In the first instance, sulphurous acid gas is produced; and in the second hydrochloric acid, by means of which the fungi are destroyed. It is sufficiently evident, however, that during this process all openings must be closed, so as to prevent any escape of the gas, and the greatest care exercised not to enter the cellar after the operation until it has been thoroughly ventilated.

DIFFERENCE IN THE ASH OF GRAPE AND OTHER FRUIT WINES.—According to Dr. Tuchschmid, the difference in the ash of combustion of grape wine and of fruit wine, may be used as a convenient mode of detecting the adulteration of the former by the latter: since, while fruit wine contains 1 to 4 tenths of carbonate of lime, grape wine, at the highest, contains only about 5-hundredths.

LIMING FRUIT-TREES.—The periodical liming of fruit-trees is generally considered as serviceable, especially in keeping down the ravages of the insects which find their home in the fissures of the bark. It is also important that the operation should be likewise extended to the main branches. For the purpose in question, white-wash has generally been used, causing a decided whiteness of the tree, which is objected to by many persons on the score of the unsightly appearance and the readiness with which the lime becomes detached. It has been shown, however, by experience, that the same beneficial effect results from the use of colorless lime-water, which every one knows how to prepare with unslacked lime, and which, when settled and become clear, can be poured off and used as above indicated. In this way repeated applications can be made without affecting the appearance of the tree.

CAUSES OF THE ROTTING OF FRUIT.—According to Decaisne, the rotting of fruit is produced by two microscopic fungi, which develop in moist, confined air; namely, *Mucor mucedo* and *Penicillium glaucum*, infinitely minute germs of which are continually floating in the atmosphere, and which attack more especially any injured or abraded portion of the surface. If, now, the fruit be wrapped up in cotton, or with soft tissue-paper, or, still better, with waxed paper or tin-foil, the introduction of these germs will be prevented, and the fruit can be kept for a long time without any appreciable change.

INFLUENCE OF FOOD ON THE QUALITY OF PORK.—As the result of experiments in England upon the influence of food upon the quality of pork, it is stated that pigs nourished with milk give the best-flavored meat and the greatest weight; next to which come those fed with grain, maize, barley, oats, and peas. Potatoes furnish a loose, light, tasteless

flesh, which wastes away very much in cooking; while that of animals fed upon clover is yellow and of a poor flavor. Oil-cakes and oil-seeds produce a loose, fatty flesh, of an unpleasant taste; beans a hard, indigestible, and unsavory meat; and acorns are but little better.

PREVENTING THE GERMINATION OF POTATOES IN CELLARS.—Much trouble is experienced by farmers and others who have occasion to store potatoes for a considerable length of time, in preventing their germination, and consequent depreciation in value as food; and our readers may be interested to know that experiments, prosecuted in Germany, have shown how this may be measurably prevented. This is accomplished by exposing the potatoes to the vapor of sulphurous acid, by any of the various well-known modes, and a large mass of potatoes can be treated at one time. This process, if not entirely effective in accomplishing the object, will retard or modify the sprouting of the potato to such an extent as to render the injury caused thereby very slight. The flavor of the potato is not affected in the least by this treatment, nor is its vitality diminished; the action being simply to retard or prevent the formation and growth of the eyes.

ABSORBENT POWER OF SOILS.—We hear more or less now-a-days of the "absorbing power of the soil;" this referring to that peculiarity by which the various soluble substances, particularly, however, inorganic, and among them a series of plant nutrients are so deposited or held that their solution, filtered through the earth, emerges much poorer in these substances, in consequence of this filtration, than when entering. A proof of this property in the soil is shown by a simple experiment, which consists in filling a bottle (having a small hole at the bottom) with fine river sand, or dug and sifted garden earth. If, now, dung-water, quite offensive in smell, be poured into this gradually, until the whole mass is saturated with the liquid, this, on emerging from the lower opening, will appear colorless and odorless, the peculiarities of the water being entirely changed. It is certain that this property, possessed by soils, of attracting soluble substances from their solutions, has a very important influence upon the practice of agriculture, although much remains to be done in order to utilize it. This much is certain, that the finer constituents of the soil, especially the clay and humus, possess the property, partly by capillary attraction and partly by chemical transmission and exchange, of attracting definite quantities of soluble plant-nutrients, especially ammonia, potash, phosphoric acid, and sulphuric acid, and other salts, and from dilute watery solutions to make them so much less soluble that they can only be extracted again, very slowly, by the long-continued action of water. It is to this that we owe the fact that the substances most important for the nutrition of plants are not continually removed from the soil by the rain, and that putrescent or offensive liquids undergo a purification by striking through the earth; that with insufficient manuring, clay soils lose their fertility more slowly than sandy soils, &c.

The absorbing power of the soil appears to be in direct proportion to its adhesiveness; and as sandy soils possess this peculiarity in a less degree, the manures applied to them pass off more readily, to the injury of vegetation. This fact has been acted upon for a long time, since it is the practice to apply a slight but oft-repeated manuring to sandy soils, while with the heavier soils the reverse may be the case.

SCARCITY OF SMALL BIRDS IN FRANCE.—A recent writer in Les Mondes remarks upon the great scarcity in France during the present year of small insectivorous birds, and ascribes this to the extreme rigor of the preceding winter, which caused myriads of the feathered

tribes to perish with hunger and cold. The consequences of this scarcity, according to the writer, were very soon manifested in the unusual amount of devastation caused by the caterpillars, which, not satisfied with devouring the leaves and young shoots, have even eaten into the wood, fruit trees being attacked in preference to others, and to such an extent that many orchards and groves in May were as destitute of foliage as at Christmas.

PROPER METHOD OF STORING POTATOES.—According to the English Mechanic, potatoes should always be stored in as dry a state as possible, and should any disease be discovered among them, small quantities only should be pitted together; certainly not more than thirty bushels in each pit. In the center of this pit should be placed a lump of lime about the size of a man's head, and before covering them in they should receive a good dusting of quick-lime. The lime absorbs the moisture during the time the potatoes sweat, and by so doing prevents the tubers from overheating, while its application also greatly improves the quality of the potatoes, no doubt absorbing much of the water from the tubers, and consequently making them more mealy than if pitted without lime. After the potatoes have been lying in the pit for at least a month, they should be carefully looked over, and may be placed together in one or more large pits, in the center of which should be placed a large basket of hard lumps of lime, or, should the pits be in the form of long trenches, it will be well to place other baskets at about twelve feet apart. The whole heap should also be well sprinkled with lime before covering it. The pits should be made low and narrow, as they are thus less liable to heat than if made wide and high.

PREVENTING IRON GARDEN-TOOLS FROM RUSTING.—It is said that if iron garden-tools are laid for a few minutes into a solution of soda, they will be protected from rusting for a long time, even if exposed continuously to a moist atmosphere.

UTILIZATION OF LIQUID SEWAGE.—A contract has recently been entered into by the police board of Glasgow for the supply from the public urinals of 5,000 gallons of liquid sewage per day, for the sum of 1,000 pounds sterling per annum. This substance is to be subjected by the purchasers to a chemical treatment for the purpose of converting it into sulphate of ammonia.

SPECIFIC-GRAVITY TEST FOR POTATOES.—A simple test adopted in Germany for determining the comparative value of different samples of potatoes as food, consists in the use of a saline solution of a certain strength, in which the potatoes are placed, and observing the depth to which they sink. Those which sink the deeper, and especially those that settle to the bottom, are the more valuable varieties; while the poorer qualities float at the top. As this method depends for its principle upon the fact that the amount of the starch in the potato is in the ratio of its specific gravity, a much simpler method of getting the absolute value consists in subjecting the potato directly to the ordinary specific-gravity test, and making the comparisons accordingly.

DEPARTMENT REPORT ON THE PREPARATION OF TIMBER.—A valuable report has just been published by the Engineer Department at Washington, as prepared by Captain T. J. Cram, upon the decay of timber, and the methods for its preservation for military and engineering purposes. The experiments of Captain Cram have tended to show that, for a limited period at least, creosoting the timber before immersing it in sea-water is practically a preservative against the attack of boring mollusks or crustaceans as well as ordinary decay, the trial hav-

ing now lasted, in some instances, for as many as twenty years, without any apparent change in the wood.

This is in confirmation of the special report of the Academy of Sciences of Amsterdam, upon experiments made by the direction of the Netherlands government. Similar experiences seem to have resulted from the creosoting of wood for railroad purposes, as well as for gun-carriages and other engines of warfare.

The report of Captain Cram discusses the general theory of the application, and the methods of subjecting wood to the desired treatment; and it is maintained by him that its application to breakwaters, Government wharves, piers, and other Government constructions on the lakes, and on the sea-coast, will result in an enormous saving of expense. General Gilmore, in an appendix to the report, expresses his opinion that the Bethell process, with its American modification of the Seeley & Robbins processes, is cheaper and more effective than any other, this consisting essentially in impregnating the timber by boiling it in coal-tar with carbolic acid.

Rust in wheat.—It is at present well established that rust in grain is produced from the spores of a microscopical fungus growing upon the barberry and various rough-leaved plants, alder, &c. These, falling upon the leaves of the cereals and other grasses, develop very rapidly, and in turn yield the summer spores of a similar character, by which the affection is propagated with inconceivable quickness. The winter spores, which are produced last, form on the first-named plants other fungus growths the next year, and thereby secure the continuance of the rust from season to season.

The proper methods of preventing grain from taking this affection, consist, first, in extirpating the barberry and other trees mentioned from the vicinity of the grain-fields; next, the grain should be cleaned with the utmost care, so that no seeds of the fungus-bearing plants may be introduced into the field in the sowing, and thus aid in the development of the disease; and finally, no manure should be applied to the grain-fields in which any straws are mixed that have come from rusted plants, and, in fact, straw of this character should be burned as the most effectual method of protection against the spreading of the disease. If used at all as manure, however, it should be kept for grass-lands or fields in which grain is not raised.

Water glass for budding trees.—An important use of water-glass is made in budding trees, for which purpose it is to be mixed with finely powdered whiting or finely sifted chalk into a paste, and the wounded parts of the tree covered with it. In this way the exposed surfaces will be completely protected against the action of the weather, and by timely application and proper manipulation all injurious results from the operation may be avoided.

Extraction of ammonia from the atmosphere by humus.—In the course of certain experiments made by Bretschneider upon the extraction of ammonia from the atmosphere by humus substances, he came to the conclusion that the anitrogenous, brown, organic combinations which are obtained by boiling a solution of sugar with dilute sulphuric acid have the property, when moist, of extracting ammonia, in a dry season, from an atmosphere poor in ammonia; second, that this absorption of ammonia, although relatively slight, is yet incomparably greater than the power of absorption of a surface of water for the ammonia contained in the atmosphere, and also incomparably greater than that of moist quartz; third, if the brown combinations are mixed in ascending proportions, without quartz, so that the former constitute 1, 3, and

5 per cent. of the weight of the latter, the moist mixtures of the same surface have a disproportionately great power of absorption for the ammonia of the atmosphere in a dry season, and increasing more than proportionally with an increasing amount of ulmin.

EUCALYPTUS TREE.—Much success seems to have been experienced in the introduction of several species of *Eucalyptus* from Australia into various parts of Europe and California; and it is probable that in this plant we may have a very important addition to our material resources. Its great merit consists primarily in its adaptability to regions otherwise unsuitable for the growth of forest vegetation, in the extreme rapidity of its growth, and in the great value of the wood for economical purposes. When planted in marshy land, it has a very decided effect in draining the soil, and freeing it from a malarious tendency; while it is said to thrive where the annual rain-fall is scarcely sufficient to keep ordinary trees in proper vigor.

In one case, a specimen raised in Algiers had attained, at the end of eight years, an elevation of nearly thirty-five feet, and a circumference of five feet at a distance of three feet from the ground. In Australia it reaches enormous dimensions, equaling if not exceeding in height, though not in circumference, the far-famed giant trees of California.

As is well known, trees having this rapid growth are generally soft and spongy, and of comparatively little value for timber; but the *Eucalyptus* is quite the reverse, the wood being very heavy and hard, resisting the action of air and water, as well as of most kinds of insects. In general properties it resembles the wood of the oak, and it is employed very largely for ship-timber in Australia. The growing plants disseminate an aromatic fragrance, which is supposed to be conducive to health. This is due to the volatile essential oil, which can be readily collected, and is known as *eucalyptol*. The leaves furnish 2½ per cent. of their weight of this substance, which has come into use already as a solvent of resins, and even of caoutchouc; and it is warmly recommended for the manufacture of varnish. It is also valuable as a febrifuge; and on this account, in Spain and the south of France, it has been made to replace quinine with decided advantage.

CHANGES IN THE PROXIMATE PRINCIPLES OF HERBACEOUS VEGETABLES.—Deherain maintains that the proximate principles of vegetables migrate from the older to the newly formed leaves, and that this migration is associated with a transformation of glucose into cane-sugar, while, when the seed is formed, the cane-sugar is converted into starch and the albumen into gluten, both insoluble. In this way the conversion of soluble into insoluble principles and the accumulation of substances in the seed is accounted for, and is illustrated by the following experiment: If a porous vessel, containing distilled water, be placed in another vessel containing a solution of cupric sulphate, the salt penetrates by diffusion into the inner vessel. If then a few drops of baryta-water be added to the inner vessel, the salt is precipitated, the equilibrium is disturbed, and a new portion of cupric sulphate diffuses into the inner vessel. The salt may be again precipitated by the baryta-water, and the operations repeated till eventually the whole of the cupric sulphate will have passed into the porous vessel, and there become precipitated.

POWER OF SOILS IN ABSORBING GASES.—Prof. Reichardt, of Jena, has instituted a series of experiments, with the aid of Herr Scheermesser, upon the capacity of the constituents of the earth to absorb gases, and has been led to the following conclusions: 1. The power of absorbing carbonic acid gas exhibited by clay purified with hydrochloric acid,

as well as that dried at a temperature of 212° Fahrenheit, or even brought to a red heat, and also that of purified kaolin, is very slight, compared with that which contains hydrated oxide of iron. 2. Sand, purified with hydrochloric acid, and brought to a red heat, absorbs very slowly traces only of carbonic acid. 3. Mixtures of clay and sand, in a dry condition, absorb traces only of carbonic acid; but notably larger quantities in a moist condition. Exposed to the rays of the sun when moist, they lose the carbonic acid absorbed, but in the shade again take it up gradually. The absorption of carbonic acid by the pure mixture is, nevertheless, quite inconsiderable compared with that containing hydrated oxide of iron. 4. The percentage of carbonic acid in hydrated oxide of iron is constantly very considerable, even if variable; the difference depending upon the density of the deposit, the temperature at which this is dried, and upon its degree of moisture. 5. The amount of carbonic acid in the soils increases in proportion to their percentage of hydrated oxide of iron. 6. The action of the sun's heat upon dry mixtures of earth is to drive out a large part of all the carbonic acid absorbed. 7. Moist mixtures of earth lose all their carbonic acid under the action of the sun's rays much easier than dry. 8. The relation of oxygen to the nitrogen is altered by moisture in favor of the latter. 9. By heating to 212° Fahrenheit nearly all the carbonic acid is driven out from mixtures of earth. 10. According to all the experiments, mixtures of earths give off carbonic acid under the influence of an elevated diurnal temperature, but the supply is again renewed during the night; the percentage also is always greater in the morning than toward evening. 11. Direct experiments upon the action of hydrated oxide of iron and water upon carbonate of lime prove in the most striking manner the solvent action under its influence in giving off carbonic acid.

ENZOOTIC MISCARRIAGE IN CATTLE.—M. Bouley, well known for his researches into the subject of the diseases of cattle, such as carbuncle, &c., has lately made a communication to the Academy of Sciences of Paris, based upon some investigations of M. Zundel upon epidemic, or what he calls enzootic, miscarriage in cattle. He states that it has long been known that when a cow undergoes a miscarriage in a stable occupied by other cows in a condition of gestation, this accident does not remain isolated, but, on the contrary, and in fact very commonly, the remaining animals miscarry successively, as though a contagious principle had been disengaged from the first case and communicated to all the others. It has already been shown by experiment that if the liquids discharged by a cow that has just miscarried be introduced into the vagina of another cow nearly at full term, the miscarriage will take place in the second case.

According to Franck, this is produced by the micrococci or bacterias, which exist in an extraordinary quantity upon the fœtal envelopes, and conduce to their decomposition. These being introduced into the vagina multiply with great rapidity, penetrate to the uterus, and there initiate that decomposition of which abortion is the consequence.

M. Roloff, on his part, has stated his belief that this enzootic miscarriage results from the introduction into the vagina of substances which have been tainted by the vaginal discharges of the cattle in which abortion has already taken place, and which are taken up in the liquids of the stable, and in the littering, these exhibiting their action upon the vaginal mucous membrane by a reddening and tumefaction which always precede the manifestation of the accident. If these views be in any way correct, it is probable that the remedy for the disease consists in purifying the stable and disinfecting the cattle, which may be done by

vaginal injections of very dilute carbolic acid, or of permanganate of potash, so as to destroy any infection germs that may have penetrated therein.

Hatching silk-worm eggs at will.—M. Duclaux has presented to the Academy of Sciences of Paris an article upon the method of producing at will the hatching of the eggs of the silk-worm, in which he remarks that shortly after their discharge, and as soon as a change of color takes place, the egg enters upon a kind of rest, or sleep, which usually lasts until winter, and from which it can only emerge under the action of cold, in consequence of which the evolution of the embryo—stationary until that time—has a beginning. The impulse once given, this evolution must go on, and sometimes is interfered with very materially by continued cold, so as to cause the death of the eggs, or else results in a feeble progeny, that becomes involved in disease. The duration of this second period in the history of the egg, occupying from 3 to 3½ months, cannot be materially modified when once begun without danger, but the first, lasting 5 or 6 months, is more manageable, and the period can be reduced to 20 days, or extended to 18 months, at will. To prevent an egg from developing at the ordinary period, it is necessary to keep it, from the moment of laying, at a temperature between 59° and 68° Fahrenheit, and to expose it to cold during a period of 15 days, at least three months before the appointed time for hatching. On the other hand, to cause the egg to hatch before the ordinary time, it is necessary to expose it to cold 20 days after laying, and to leave it at that temperature for two months, and then to remove it. Six weeks after it will be found to be in the same condition as the normal eggs, and may be treated in the same manner. In this way it is possible to have the eggs ready to hatch out at any time of the year.

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## FACTS FROM VARIOUS SOURCES.

Homesteads in Florida.—Governor Harrison Reed, in his message to the legislature, recommends "that homesteads be granted to actual settlers upon the State lands upon the same terms as now allowed by the United States Government." He also speaks of the sources of wealth, as follows: "Fish, oysters, and turtle for eleven hundred miles of sea-coast, abound, almost beyond parallel, with bays and inlets, and inland navigable waters, of an equal extent, offer the richest inducements to enterprise and capital, if properly protected by law. Let these mines of wealth be divided into convenient districts, and rented to individuals or companies for stated periods, with protection sufficient to induce the systematic working of them, and a revenue may be derived sufficient, in a few years, to pay the entire expenses of the State government. With the facilities of transportation now enjoyed, St. Andrews' Bay, Apalachicola, Cedar Keys, and Tampa Bay oysters may soon be as celebrated in the markets of Savannah, Charleston, Saint Louis, and the cities of the interior, as the "Saddle Rocks" are in New York, and instead of receiving canned oysters, sardines, and salt fish from the North, we may successfully compete in their markets with the products of any portion of the world."

Tea in Georgia.—William Jones, one of the editors of the Southern Cultivator, Athens, Georgia, has been experimenting with the tea-plant. In 1860 he received from the agricultural department of the Patent

Office, fifty plants. Keeping them in pots until February, 1861, when they were planted out five feet each way, in a loose sandy soil, they grew finely, and in April, 1862, a small quantity of tea was made. Since then, the fifty plants have increased, until he has fifteen thousand, raised from seed. They stood uninjured the severe cold of December, 1870. They do not grow as rapidly in the rolling clay soil as in the sandy land near the coast. The tea made in Georgia took premiums in 1871 at the State Fair, and the fairs at Augusta and Atlanta, and an honorable notice at Savannah.

BEET-SUGAR.—The estimates of the beet-sugar product of Europe for the present manufacturing season somewhat exceed 1,000,000 tons, a small increase upon the product of last year. France will make about 350,000 tons. The business is yearly extending.

ALMONDS IN TEXAS.—A correspondent in Williamson County has four almond trees one year old, which look very well, and seem to be as hardy as the fig. He thinks they can be grown in that State.

IRRIGATION.—A correspondent in El Paso County, Colorado, suggest, in view of the fact that the water in the valley through which the Fontaine-que-Bouille flows is inadequate to the amount of irrigation required, or to the lands susceptible of being brought into cultivation that there are large natural reservoirs near the creek in many, places, which could be filled, and thus economize the water. He asks Congress to grant these basins to any parties who will go to the expense of filling them with water for the purposes of irrigation.

THE AGRICULTURAL SOCIETY of Linn County, Oregon was organized in 1859, and in 1865 it became a joint-stock association. The fair-grounds consists of 150 acres, with improvements worth $6,000. The gross receipts for 1870, $2,300; for 1871, $4,000. Premiums paid in 1871, $2,675.

MILTON AGRICULTURAL AND HORTICULTURAL SOCIETY of Ohio has lately been organized at Milton, Mahoning County, Ohio. The members withdrew from the Mahoning County Agricultural Society on account of its horse-racing and gambling, which absorbed most of the time and attention of the people, leading them to lose sight of the true claims of agriculture and horticulture. Five acres of the best land belong to the society, and active efforts are being made to render it an effective agent for doing good in the cause of agriculture.

STEAM-PLOWING.—The employment of steam in farm cultivation is extending gradually, if not rapidly, in England, At a recent meeting of the Coggeshall Agricultural Society, the case of a gentleman in Berkshire was mentioned, who uses four steam-engines of 30 horse-power, and in 1870 succeeded in stirring the soil to a depth of 30 inches, and last year went to the depth of three feet. He grew 1,600 acres of beet-root last season for the manufacture of brandy. Another suggestive example was reported at the same meeting. Three years ago the Duke of Northumberland made an arrangement with his tenants, by which he furnished a 12 horse-power engine, those using it being charged their pro rata share for the original outlay, for the wear and tear, with a slight reserve for a new one. The first year the land was plowed at 10 shillings per acre, and deeply cultivated at 5 shillings per acre. If cultivated the second time, the charge was, for plowing, 2s. 6d. per acre, and harrowing, 1s. 6d., not mere harrowing of three-inch teeth, but with machines cultivating 12 to 15 inches. As priority in the use of the plow was important, it was decided that the man whose 30-acre field was first ready should have it, and so on, and when it became an even question, lots were drawn. The result, after three years' trial, has been extremely

satisfactory, largely increasing the profits of the farmer, with a beneficial effect upon the country at large.

WARREN COUNTY, KY.—The surplus productions of this county, shipped on the Louisville and Nashville Railroad, for the year ending June 30, 1871, were: 63,645 bushels wheat, value, $77,556; 3,217 bushels corn, $1,609; 1,011 bushels other grains, $505; 2,766 hogsheads tobacco, $331,920; 1,519 barrels flour, $12,160; 221 barrels potatoes, $552; 45 barrels pork and lard, $1,350; 136 barrels liquor, $12,240; 520 horses and mules, $77,000; 3,180 cattle, $95,400; 24,000 hogs, $384,000; 164 car-loads of coal, $6,150; 195 car-loads of lumber, $32,760; 20 car-loads of brick, $720; 5 car-loads of rock, $250; 2,300,663 pounds general merchandise, $230,066; 78,323 pounds fruit, $3,916; 1,800 sheep, $5,400; 67 casks of bacon, $5,360. Total value shipped as freight, $1,280,854. By express: 214,553 dozen eggs, $42,910; 140,500 pounds butter, $28,100; 175,500 pounds fowls, $22,815; 40,000 pounds wool, $16,000; 20,000 pounds feathers, $10,000; 2,000 dozen brooms, $5,000; 24,728 pounds peltries, $2,472. Total by express, $127,297. The grand total was $1,408,151; and as there is but little not the produce of the soil, the record is worthy of consideration. There was but little corn shipped, that going mostly into pork.

TREE CULTURE.—A farmer in Osage County, Kansas, has planted within the past five years several thousand forest trees, such as oak, walnut, soft maple, elm, white ash, sycamore, catalpa, white and yellow willow, mulberry, and cottonwood. Many of the cottonwoods are now nearly 30 feet high and six inches in diameter.

SILK COCOONS.—The total product of silk cocoons in the United States, as reported in the census of 1870, is 3,945 pounds, of which California produced 3,587; Pennsylvania, 1; Virginia, 15; North Carolina, 95; Georgia, 14; Mississippi, 31; Louisiana, 1; Tennessee, 153; Kentucky, 45; and Missouri, 3.

WHEAT CROP IN ENGLAND.—Mr. J. B. Lawes has published an estimate of the wheat crop of Great Britain for 1871, in which he predicts that the supply will show a great deficiency. He bases his estimate on the fact that the census returns of 1871 show that the average number to be fed in the British Islands, during the ensuing twelve months, is 31,843,970; and assuming the average consumption of wheat to be 5½ bushels per head, the quantity required will be little short of 22,000,000 quarters. Taking the home produce at 24 bushels per acre, (of 61 pounds per bushel,) and the area under wheat to be the same as returned for 1870, viz: 3,773,663 acres, the gross produce of the United Kingdom will amount to about 14,666,667 quarters. Deducting from this 2¼ bushels per acre for seed, there is left for consumption as food about 10,250,000 quarters, leaving a requirement of 11,500,000 quarters to be supplied from foreign sources. Other writers estimate the deficiency at 13,000,000 quarters, that will be required from other countries, besides enormous quantities of other grain, meat, butter, cheese, eggs, &c. There are, besides, several circumstances pointing to a large consumption of bread during the coming harvest year. Meat is exceedingly dear in England; labor is in great demand, and full wages are paid. The potato disease has appeared, with a virulence unequaled since 1846, in various districts, and although the extent of its ravages cannot yet be stated, it is certain that this crop will prove lamentably short. The information at present at command leaves no reason to fear that there will be any deficiency of foreign corn to meet the above want, though prices have advanced in Hungary and Russia, notwithstanding the accumulations of old wheat. The imports of wheat into England for the first nine months

of 1871 exceed those of the corresponding period of the preceding year by nearly $20,000,000; about one-third of the imports were from the United States.

CHEESE FACTORIES.—The American cheese-factory system is affecting the markets of England to such a degree that, at the late discussions of the Ayrshire Farmers' Club it was stated that this system must be introduced there generally, or they must give up dairying, on the old system, altogether. In the rich grazing district of Cheshire, where 11,000 tons of the best cheese in England is made, the American factory system is being introduced with great favor; and in other districts it is proposed to send deputations to this country to fully investigate the workings of our cheese factories. At a large sale of cheese in Liverpool, the product of the Derbyshire cheese factory sold higher than the produce of the Cheshire dairies generally. Many dairymen have expressed their decided conviction that under the factory system they could manufacture cheaper, and produce a superior article, with a great relief to farmers' wives. While Cheshire cheese has not advanced in price from what it was fifty years ago, butter, for several years, has been sold, steadily, sixty per cent. higher.

CONDENSED MILK is becoming a large and new trade, and will ultimately contribute largely to the food of the world. Milk is wanted not only at sea, but in the rapid growth of many large cities, pure milk, as an article essential to children, becomes less and less abundant. Condensed-milk factories have been established in various places in Great Britain, in the Argentine Republic, and even in Australia, whence condensed milk has become an article of export to Europe.

PHYSICAL DEGENERACY OF CITY POPULATION.—At the last meeting of the British Social Science Association it was stated as an unquestionable fact that, with the increase of factory and in-door work, the physical type in Englishmen has degenerated of late years. Broad chests and powerful limbs are no longer the rule among laborers and artisans, and the recruiting sergeant complains that the doctor rejects every year a large proportion of the men recruited by him, and even those admitted to the ranks are very inferior in bone and muscle to their older comrades. Of those enlisted in the last few years, 38 per cent. have been rejected; in some districts four out of five are rejected on the ground of physical disqualification. This is ascribed to the concentration of the working classes in cities, to the depressing circumstances of their city life, and to the large proportion of those engaged in in-door employments. So many females also are withdrawn from rural to factory life, that gross ignorance as to the use and preparation of food, and of domestic economy and cooking, abounds among the poor, rendering their condition deplorable.

IRRIGATION.—It is suggested in England that Parliament, by special act, authorize two or more landholders to join together for united action in the construction and development of irrigation works, and that loans at low interest be granted by government upon the security of the property thus improved. So important is this subject considered by the Spanish government that irrigation works are authorized by the "Ley del Agua," by an enactment most judicious and comprehensive.

ADULTERATION OF TEA.—So extensively is this now carried on in China, that Mr. Medhurst, the British consul at Shanghai, states that when he wrote 53,000 pounds of willow-leaves were in course of manipulation at one port alone, to be mixed with tea for shipment at the ratio of from 10 to 20 per cent. The trade in these willow-leaves (which

cost about four cents a pound) is openly carried on, and not the slightest attempt is made to disguise the object for which they are prepared.

DISEASES OF CATTLE.—The London Veterinarian says the present condition of Europe with regard to the cattle plague is not very reassuring. It still threatens Germany, and has not been exterminated either in Galicia or Lower Austria. It has broken out in Poland, on the direct line of railway leading into Silesia; also in the Baltic province of Livonia in Russia, near the port of Riga, and among the cows in the dairies of St. Petersburg, besides existing to an alarming extent in Southern Russia, where sheep as well as cattle are attacked. It has also appeared in several departments in France, extending its ravages from the neighborhood of Paris toward the channel coast at Havre and Dieppe. In Holland, however, the pleuro-pneumonia has been steadily declining for several months.

The foot and mouth disease still retains a strong hold in many parts of Great Britain, and is reported as existing in eighty-two counties. Fairs and markets in connection with the Irish cattle trade have proved prolific sources of mischief. It exists in Holland; and a cargo of twelve hundred sheep, landed at Harwich from Rotterdam, four of them being found infected with the disease, the whole were immediately slaughtered at the place of landing. Other cargoes from the same port, in which the disease was detected, were summarily dealt with in the same manner.

The small-pox in sheep has increased to rather a serious extent in Pomerania and other parts of the North German States. Inoculation continues to be carried out on a large scale, farmers having the fullest confidence in its protection against the natural disease, as well as that the benign nature of the inoculated sheep-pox rarely leads to fatal results. English farmers generally concur in this opinion.

The influenza in horses, which was noticed and excited alarm in the stables of New York, a few months since, is going the rounds of the large towns and cities of Europe; in some places in England it has made great havoc. The pathology of this disease requires a more full investigation than it has yet received.

CARBOLIC AID IN VETERINARY PRACTICE.—La Tribune Médicale of Savoy states that a destructive epidemic of cattle plague was arrested by the following treatment: 1. Bleed to the extent of three quarts. 2. Administer a quart of lukewarm water, in which are dissolved two and a half drachms of crystalized carbolic acid. 3. Give, once or twice, four quarts of strong infusion of coffee. 4. Energetic frictions to excite cutaneous reaction. 5. Scarify the infiltrated regions. 6. In the course of the complaint give several quarts of the infusion of gentian. 7. Dress with a solution of the above-mentioned carbolic acid, above the pustules which form on the hide. In this manner fifty cows, seven horses, and one pig were treated, of which only one cow died, and the epidemic was arrested.

WILD BEASTS AND SNAKES IN INDIA.—The Viceroy of India has continued and extended the liberal rewards for the destruction of wild beasts and snakes. The following record of dreadful deaths from both causes, during three years, is condensed from the Government Gazette. Killed by wild beasts, by the returns from only ten districts, 12,554; killed by snakes, in nine districts, 25,664; total from both causes, 38,218, and these are only the cases officially reported. How many thousands of other deaths, from the same horrible causes, in districts not reported, and in lonely, isolated villages, dreary swamps, and wild jungles, from which official reports cannot be obtained, will never be known. The

sanguinary horrors of Waterloo, Trafalgar, and any year of Napoleon's battles, hardly equal this.

FORESTRY; FORETHOUGHT.—In England there are about 40,000 acres of young oaks and other growing timber, planted in inclosures by authority of acts of Parliament, of which 10,000 were planted last year. Of the trees thus planted for navy purposes, none of them have attained much more than half of their full one hundred years' growth; the thinnings, necessary to make room for the ultimate crop to reach maturity, produce a large income.

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# MARKET PRICES OF FARM PRODUCTS.

| Articles. | January. | | | Articles. | January. | | |
|---|---|---|---|---|---|---|---|
| **NEW YORK.** | | | | **BOSTON—Continued.** | | | |
| Flour, superfine State.. per bbl. | $5 70 | to | $6 10 | Cheese, N. Y. and Vt. choice | | | |
| extras.....do.... | 6 40 | to | 7 10 | factory.....per lb.. | $0 13½ | to | $0 14½ |
| superfine western .do.... | 5 70 | to | 6 10 | Ohio choice factory..do. | 12½ | to | 13½ |
| extra to choice ....do.... | 6 35 | to | 9 35 | Hay.....per ton.... | 30 00 | to | 36 00 |
| extra southern.... do.... | 6 60 | to | 7 35 | Tobacco, choice.....per lb.... | 12 | to | 14 |
| good to choice .....do.... | 7 40 | to | 9 25 | good western ...do.... | 11 | to | — |
| Wheat, No. 1 spring..per bush.. | — — | to | — — | common & medium.do. | 10 | to | 11 |
| No. 2 spring .....do.... | 1 52 | to | 1 55 | Wool, Ohio and Penn ..per lb.. | 62 | to | 75 |
| winter, red western do.. | 1 57 | to | 1 60 | Michigan .....do.... | 60 | to | 70 |
| amber, western...do.... | 1 62 | to | 1 65 | others, western ....do.... | 60 | to | 66 |
| white, western ...do.... | 1 63 | to | 1 74 | California.....do.... | 35 | to | 55 |
| Rye .....do.... | 90 | to | 92 | Texas.....do.... | 30 | to | 47½ |
| Barley.....do.... | 90 | to | 1 00 | combing fleece .....do.... | 70 | to | 74 |
| Oats, .....do.... | 54 | to | 57 | | | | |
| Corn, new western, mixed.do.... | 77 | to | 79 | **PHILADELPHIA.** | | | |
| old western, mixed. .do.... | 79½ | to | 80 | | | | |
| Hay, shipping qualities. per ton.. | 27 00 | to | 28 00 | Flour, superfine .....per bbl.. | 5 25 | to | 5 75 |
| prime.....do.... | 29 00 | to | 34 00 | extras.....do.... | 6 00 | to | 6 37½ |
| Pork, mess .....per bbl.. | 13 00 | to | 14 50 | family & fancy brands. do. | 7 25 | to | 9 50 |
| prime .....do.... | 12 25 | to | — — | Wheat, red, Pennsylvania and | | | |
| Beef, plain mess .....do.... | 9 00 | to | 11 00 | western.....per bush. | 1 57 | to | 1 60 |
| extra.....do.... | 11 00 | to | 13 00 | amber .....do.... | 1 65 | to | 1 67 |
| Lard, .....per lb.. | 9 | to | 9⅝ | Rye.....do.... | 88 | to | 90 |
| Butter, western .....do.... | 12 | to | 23 | Corn, yellow.....do.... | 69 | to | 76 |
| State dairy .....do.... | 21 | to | 35 | mixed western.....do.... | 71 | to | 73 |
| Cheese, western dairy ....do.... | 11 | to | 13 | Oats, western white .....do.... | 54 | to | 54½ |
| State factory.....do.... | 12 | to | 14 | Pork, mess .....per bbl.. | 14 50 | to | 15 50 |
| Cotton, ordinary to good ordinary .....per lb.... | 17⅝ | to | 19⅞ | Beef, mess, city packed..do.... | 15 00 | to | 15 50 |
| low middling to good middling.....per lb.... | 20 | to | 22¾ | Lard.....per lb.. | 9½ | to | 10 |
| Tobacco, lugs, all grades. per lb.. | — — | to | — — | **BALTIMORE.** | | | |
| common leaf ....do.... | — — | to | — — | | | | |
| Wool, pulled .....do.... | 48 | to | 70 | Flour, superfine .....per bbl | 6 00 | to | 6 75 |
| tub-washed .....do.... | 68 | to | 85 | extras .....do.... | 6 50 | to | 10 00 |
| California spring clip.do. | 36 | to | 47 | family .....do.... | 7 50 | to | 10 50 |
| fall .....do.... | 35 | to | 42 | Wheat, Pennsylvania .per bush | 1 56¾ | to | 1 63 |
| Texas, inferior to fine.do. | 38 | to | 48 | western .....do.... | 1 50 | to | 1 60 |
| | | | | Maryland .....do.... | 1 57 | to | 1 70 |
| **BOSTON.** | | | | Rye .....do.... | 92 | to | 1 00 |
| | | | | Corn, yellow.....do.... | 67 | to | 70 |
| Flour, western, superfine .per bbl. | 5 25 | to | 5 75 | white .....do.... | 68 | to | 71 |
| extras.....do... | 6 25 | to | 7 50 | Oats.....do.... | 53 | to | 58 |
| choice.....do... | 7 75 | to | 10 00 | Hay, western.....per ton.. | 32 00 | to | 34 00 |
| southern extras ....do... | 6 50 | to | 7 25 | Penn. and Maryland.do.... | 33 00 | to | 38 00 |
| choice Baltimore ...do... | 9 00 | to | 10 25 | Pork, mess.....per bbl.. | 15 00 | to | — — |
| Wheat.....per bush.. | 1 60 | to | 1 65 | Butter, western, prime to | | | |
| Rye .....do.... | 95 | to | — | choice.....per lb.. | 24 | to | 26 |
| Barley.....do.... | 75 | to | 1 10 | New York.....do.... | 25 | to | 33 |
| Corn, southern yellow,....do.... | 80 | to | 81 | Cheese, western factory .do.... | 14 | to | 14½ |
| western mixed.....do.... | 77 | to | 79 | eastern .....do.... | 14 | to | 15 |
| western yellow ....do.... | 79 | to | 81 | Lard.....do.... | 9½ | to | 10½ |
| Beef, mess.....per bbl.. | 10 00 | to | 12 00 | Cotton, ordinary.....do.... | 17½ | to | 19½ |
| extra .....do.... | 12 00 | to | 13 00 | middling .....do.... | 20 | to | 20⅝ |
| Pork, prime ..... .....do.... | 11 50 | to | 12 50 | Tobacco, common to good lugs. | 7 | to | 8¼ |
| mess .....do.... | 15 00 | to | 15 50 | common to medium | | | |
| Lard .....per lb.. | 9½ | to | 11½ | leaf.....per lb.. | 8 | to | 10½ |
| Butter, N. Y. and Vt .....do.... | 18 | to | 33 | Wool, unwashed, free from | | | |
| Canada .....do.... | 20 | to | 30 | burs.....per lb.. | 40 | to | 43 |
| western..... do.... | 12 | to | 28 | tub-washed.....do.... | 58 | to | 63 |

*Market prices of farm products.*—Continued.

| Articles. | January. | | | Articles. | January. | | |
|---|---|---|---|---|---|---|---|
| CINCINNATI. | | | | ST. LOUIS—Continued. | | | |
| Flour, superfine.....per bbl.. | $5 75 | to | $6 00 | Wheat, red.....per bush.. | $1 40 | to | $1 70 |
| extra.....do.... | 6 50 | to | 6 65 | white.....do.... | 1 60 | to | 1 75 |
| family.....do... | 6 65 | to | 6 85 | spring.....do.... | 1 28 | to | — — |
| Wheat, No. 1 white...per bush.. | 1 55 | to | 1 60 | Corn, mixed.....do.... | 43 | to | 48 |
| No. 2 white.....do.... | 1 50 | to | — — | yellow.....do.... | 46 | to | — |
| No. 1 red.....do.... | 1 42 | to | — — | white.....do.... | 48 | to | — |
| No. 2 red.....do.... | 1 40 | to | — — | Oats, white.....do.... | 35½ | to | 44¼ |
| Corn, white.....do.... | 48 | to | 50 | mixed.....do.... | 37 | to | 41 |
| yellow.....do.... | 48 | to | — | Rye.....do.... | 73 | to | 75 |
| Oats, white.....do.... | 40 | to | — | Barley, winter.....do.... | 80 | to | 82½ |
| No. 1 mixed.....do.... | 38 | to | — | spring.....do.... | 62½ | to | 75 |
| Rye.....do.... | 81 | to | 82 | Hay.....per ton.. | 16 00 | to | 25 00 |
| Barley, winter, No. 2.....do.... | 75 | to | 85 | Pork, mess.....per bbl.. | 13 25 | to | — — |
| Spring, No. 2.....do.... | 75 | to | 80 | Lard, prime steam.....per lb.. | 8¼ | to | 8¾ |
| Hay, tight-pressed, common to choice.....per ton.. | 14 00 | to | 19 00 | kettle.....do.... | 8⅝ | to | — |
| loose-pressed, prime to choice.....per ton.. | 17 00 | to | 21 00 | Butter, choice.....do.... | 23 | to | 33 |
| Pork, mess.....per bbl.. | 13 50 | to | — — | medium to fair....do.... | 17 | to | 20 |
| prime.....do.... | — — | to | — — | Cheese, choice factory....do.... | 14½ | to | 15 |
| Beef, plate.....per bbl.. | 13 00 | to | 13 50 | Cotton, middling.....do.... | 18⅜ | to | 19 |
| Hams.....do.... | 26 00 | to | 28 00 | Tobacco, lugs.....do.... | 6¾ | to | 8 |
| Lard, prime steam.....per lb.. | 8⅝ | to | 8¾ | common leaf....do.... | 8 | to | 8¼ |
| Butter, western reserve...do.... | 23 | to | 25 | medium to good leaf, per lb..... | 9 | to | 12 |
| choice cent'l Ohio.do.... | 18 | to | 22 | Wool, tub-washed.....per lb.. | 59 | to | 70 |
| Cheese, western reserve..do.... | — | to | — | fleece-washed.....do.... | 48 | to | 56 |
| choice factory....do.... | 14½ | to | 15 | unwashed medium.do.... | 40 | to | 42 |
| Tobacco, lugs, West Va...do.... | 5 | to | 9 | NEW ORLEANS. | | | |
| lugs, Kentucky..do.... | 9¼ | to | 13 | | | | |
| medium leaf, West Virginia.....per lb.. | 8 | to | 15 | Flour, superfine.....per bbl.. | 7 12 | to | 7 25 |
| medium leaf, Ky.do.... | 13 | to | 16 | extras, (according to grade).....per bbl.. | 7 37½ | to | 9 75 |
| Wool, tub-washed.....do.... | 65 | to | 70 | Corn, white.....per bush.. | 74 | to | 78 |
| fleece-washed, manufacturing.....per lb.. | 50 | to | 55 | yellow.....do.... | 74 | to | 78 |
| fleece-washed, combing, .....per lb.. | 52 | to | 55 | mixed.....do.... | 74 | to | 75 |
| unwashed, manuf'g.do.... | 42 | to | 45 | Oats.....do.... | 60 | to | — |
| unwashed, comb'g.do.... | 42 | to | 45 | Hay, choice.....per ton.. | 34 00 | to | — — |
| pulled.....do.... | 52 | to | 56 | prime.....do.... | 30 00 | to | — — |
| CHICAGO. | | | | Pork, mess.....per bbl.. | 14 50 | to | 15 00 |
| | | | | Beef, mess, (Texas).....do.... | 10 00 | to | 16 00 |
| Flour, winter extras...per bbl.. | 7 60 | to | 8 25 | Lard, tierce.....per lb.. | 9¼ | to | 9¾ |
| spring extras.....do.... | — — | to | — — | keg.....do.... | 10¼ | to | 10½ |
| Wheat, No. 1 spring..per bush.. | 1 23½ | to | — — | Butter, choice western....do.... | 25 | to | 28 |
| No. 2 spring.....do.... | 1 20⅜ | to | 1 21½ | Goshen.....do.... | 33 | to | 35 |
| No. 3 spring.....do.... | 1 10⅜ | to | — — | Cheese, choice factory....do.... | 16 | to | 17 |
| Corn, No. 2.....do.... | 40½ | to | 40⅝ | western reserve..do.... | 13 | to | 14 |
| rejected.....do.... | 38 | to | — | New York cream.do.... | 16 | to | 17 |
| Oats, No 2.....do.... | 31⅜ | to | 32½ | Cotton, ordinary to good ordinary.....per lb.. | 18⅜ | to | 18⅝ |
| rejected.....do.... | 28 | to | — | middling to good middling.....per lb.. | 18⅞ | to | 20 |
| Rye, No. 2.....do.... | 63¼ | to | 63½ | Tobacco, lugs.....do.... | 7 | to | 8 |
| Barley, No. 2.....do.... | 60½ | to | 61 | low leaf.....do.... | 8 | to | 8½ |
| Hay, timothy (on track).per ton. | 12 00 | to | 15 00 | medium leaf....do.... | 9 | to | 9½ |
| prairie.....do.... | 9 00 | to | 13 00 | SAN FRANCISCO. | | | |
| Pork, mess.....per bbl.. | 13 00 | to | 13 10 | | | | |
| extra.....do.... | — — | to | — — | Flour, superfine.....per bbl.. | 6 00 | to | — — |
| Beef, mess.....per bbl. | 8 00 | to | 8 25 | extra super.....do.... | 6 25 | to | 6 50 |
| Lard.....per lb.. | 8½ | to | 8⅝ | higher grades.....do.... | 7 00 | to | 7 25 |
| Butter, choice dairy.....do.... | 20 | to | 25 | Wheat, State.....per cental.. | 2 15 | to | 2 35 |
| fair to good tub and firkin.....per lb.. | 14 | to | 17 | Oregon.....do.... | 2 25 | to | 2 35 |
| Cheese, New York factory.do.... | 15½ | to | 16 | Corn, white.....do.... | 2 10 | to | — |
| western, factory...do.... | 13 | to | 15 | yellow.....do.... | 2 15 | to | — — |
| Ohio, factory.....do.... | 14 | to | 15 | Hay, State.....per ton.. | 18 00 | to | 23 00 |
| Wool, medium fleece.....do.... | 58 | to | 62 | Pork, mess.....per bbl.. | 19 00 | to | 20 00 |
| unwashed medium.do.... | 38 | to | 43 | prime.....do.... | 17 50 | to | 18 50 |
| tub-washed.....do.... | 50 | to | 75 | Beef, mess.....do.... | 13 00 | to | 14 00 |
| ST. LOUIS. | | | | Lard.....per lb.. | 11¼ | to | 13 |
| | | | | Butter, overland.....do.... | 20 | to | 32½ |
| Flour, superfine.....per bbl.. | 5 25 | to | — — | California.....do.... | 35 | to | 40 |
| extras.....do.... | 5 75 | to | 6 85 | Oregon.....do.... | 20 | to | 25 |
| choice.....do.... | 7 35 | to | 8 50 | Cheese.....do.... | 15 | to | 17 |
| | | | | Wool, native.....do.... | 18 | to | 20 |
| | | | | California.....do.... | 22½ | to | 35 |
| | | | | Oregon.....do.... | 30 | to | — |

The above quotations represent the state of the market as nearly as possible at the opening of the month.

# METEOROLOGY.

## DECEMBER, 1871.

[COMPILED IN THE DEPARTMENT OF AGRICULTURE FROM REPORTS MADE BY OBSERVERS OF THE SMITHSONIAN INSTITUTION.]

*Table showing the highest and lowest range of the thermometer, the mean temperature, and amount of rain and melted snow. Observations daily at 7 a. m. and 2 and 9 p. m.*

| State and station. | County. | Observer. | Date. | Maximum temperature. | Date. | Minimum temperature. | Mean temperature. | Rain and melted snow. |
|---|---|---|---|---|---|---|---|---|
| MAINE. | | | | *Deg.* | | *Deg.* | *Deg.* | *In.* |
| Surry | Hancock | Oscar H. Tripp | 24 | 47 | 21 | −14 | 21.9 | ..... |
| Bucksport | ....do | Willabe Haskell | 4 | 43 | 21 | −10 | 21.4 | ..... |
| Orono | Penobscot | M. C. Fernald | 4 | 44 | 21 | −11 | 17.0 | 4.16 |
| Brewer Village | ....do | E. D. Mayo | 4 | 43 | 21 | − 5 | 20.6 | ..... |
| Montville | Waldo | A. J. Clifford | 24 | 44 | 21 | −15 | 17.3 | 4.07 |
| Do | ....do | J. R. Clifford | 24 | 44 | 21 | −12 | 19.1 | 3.75 |
| Palermo | ....do | B. C. Wentworth | 24 | 43 | 21 | −11 | 19.1 | ..... |
| West Waterville | Kennebec | B. F. Wilbur | 24 | 44 | 21 | −10 | 19.4 | 4.52 |
| Gardiner | ....do | R. H. Gardiner | 4 | 46 | 21 | −10 | 20.0 | 3.28 |
| Lisbon | Androscoggin | Asa P. Moore | 24 | 50 | 21 | −19 | 20.0 | 2.45 |
| Standish | Cumberland | J. P. Moulton | 4 | 49 | 21 | −11 | 22.7 | 4.18 |
| East Wilton | Franklin | H. Reynolds, M. D | 25 | 45 | 21 | −13 | 17.1 | 3.40 |
| Norway | Oxford | H. D. Smith | 25 | 44 | 21 | −16 | 18.2 | 3.30 |
| Cornish | York | Silas West | 25 | 44 | 21 | − 7 | 19.9 | 2.87 |
| Cornishville | ....do | G. W. Guptill | 25 | 46 | 21 | −12 | 20.4 | 4.40 |
| NEW HAMPSHIRE. | | | | | | | | |
| Stratford | Coos | Branch Brown | 25 | 43 | 21 | −22 | 15.9 | 3.06 |
| Tamworth | Carroll | Alfred Brewster | 25 | 45 | 16 | −16 | 19.0 | 4.32 |
| Contoocookville | Merrimack | E. D. Couch | 28 | 53 | 21 | − 9 | 23.5 | 3.00 |
| Amoskeag | Hillsborough | Alfred Colby | 4 | 47 | 21 | −12 | 22.4 | 2.90 |
| VERMONT. | | | | | | | | |
| Lunenburgh | Essex | H. A. Cutting | 24 | 45 | 21 | −20 | 17.3 | 3.70 |
| Craftsbury | Orleans | Rev. E. P. Wild | 25 | 40 | 21 | −24 | 13.2 | 2.98 |
| Randolph | Orange | C. S. Paine | 25 | 46 | 21 | −24 | 18.9 | 2.72 |
| Woodstock | Windsor | Doton & Miller | 25 | 41 | 16 | −21 | 16.5 | 2.55 |
| Norwich | ....do | S. B. Phelps | 25 | 45 | 21 | −16 | 21.9 | 3.79 |
| Near St. Albans | Franklin | A. H. I. Gilmour | 23 | 47 | 21 | −23 | 16.6 | 2.70 |
| West Charlotte | Chittenden | Miss M. E. Wing | 24 | 46 | 21 | −12 | 23.4 | 1.95 |
| Panton | Addison | D. C. and M. E. Barto | 4, 24, 25 | 40 | 21 | −18 | 19.3 | 4.12 |
| Castleton | Rutland | Rev. R. G. Williams | 23 | 51 | 21 | −17 | 20.1 | 2.74 |
| MASSACHUSETTS. | | | | | | | | |
| Kingston | Plymouth | G. S. Newcomb | 25 | 55 | 21 | − 6 | 29.5 | 2.50 |
| Lawrence | Essex | John Fallon | 4, 25 | 48 | 21 | − 6 | 24.3 | 2.30 |
| Milton | Norfolk | Rev. A. K. Teele | 26 | 60 | 21 | 0 | 29.5 | 3.85 |
| New Bedford | Bristol | Samuel Rodman | 25, 26 | 48 | 21 | − 2 | 28.8 | 2.31 |
| Do | ....do | E. T. Tucker | 4 | 48 | 21 | − 3 | 28.7 | 2.94 |
| Do | ....do | George S. Hart | 25 | 51 | 21 | − 2 | 31.7 | 2.28 |
| Cambridge | Middlesex | Mrs. S. H. Perry | 4 | 52 | 21 | − 6 | 27.2 | ..... |
| North Billerica | ....do | Rev. E. & W. W. Nason | 25 | 51 | 16, 21 | − 4 | 26.5 | ..... |
| Mendon | Worcester | J. G. Metcalf, M. D | 23 | 50 | 21 | − 6 | 24.4 | 2.90 |
| Lunenburgh | ....do | G. A. Cunningham | 25 | 53 | 21 | − 8 | 24.1 | 4.03 |
| Worcester | ....do | M. Bemis, M. D | 30 | 80 | 21 | 1 | 27.1 | 1.55 |
| Amherst | Hampshire | Prof. E. S. Snell | 4 | 43 | 21 | − 6 | 24.5 | 2.67 |
| Hinsdale | Berkshire | Rev. E. Dewhurst | 23 | 42 | 21 | −20 | 22.0 | ..... |
| Williamstown | ....do | Prof. A. Hopkins | 23 | 50 | 21 | −11 | 24.3 | 2.72 |

*Table showing the highest and lowest range of the thermometer, &c.*—Continued.

| State and station. | County. | Observer. | Date. | Maximum temperature. | Date. | Minimum temperature. | Mean temperature. | Rain and melted snow. |
|---|---|---|---|---|---|---|---|---|
| RHODE ISLAND. | | | | | | | | |
| | | | | *Deg.* | | *Deg.* | *Deg.* | *In.* |
| Newport | Newport | W. A. Barber | 4 | 48 | 21 | 1 | 31.3 | 2.41 |
| CONNECTICUT. | | | | | | | | |
| Columbia | Tolland | W. H. Yeomans | 24 | 52 | 21 | — 6 | 25.9 | 2.37 |
| Middletown | Middlesex | John Johnston | 25 | 47 | 21 | — 7 | 25.2 | 2.17 |
| Southington | Hartford | L. Andrews | 23 | 50 | 21 | — 5 | 26.3 | 2.77 |
| Colebrook | Litchfield | Charlotte Rockwell | 25 | 51 | 21 | —14 | 21.5 | 2.75 |
| Round Hill | Fairfield | Rev. W. P. Alcott | 23 | 48 | 21 | — 7 | 25.2 | 1.89 |
| NEW YORK. | | | | | | | | |
| Moriches | Suffolk | E. A. Smith & daughter | 24 | 57 | 21 | — 7 | 32.1 | 3.00 |
| South Hartford | Washington | G. M. Ingalsbe | 25 | 50 | 21 | —20 | 22.7 | 3.72 |
| North Argyle | ....do | George M. Hunt | 23 | 47 | 21 | —23 | 19.2 | 3.40 |
| Garrison's | Putnam | Thomas B. Arden | 23 | 48 | 21 | — 2 | 28.0 | 2.91 |
| White Plains | Westchester | Prof. O. R. Willis | 24 | 49 | 21 | 0 | 29.6 | ..... |
| Cooper Union | New York | Prof. O. W. Morris | 24 | 53 | 21 | 5 | 31.5 | 2.29 |
| Brooklyn | Kings | I. P. Mailler | 24 | 49 | 21 | — 2 | 30.1 | 3.15 |
| Flatbush | ....do | Rev. E. T. Mack | 24 | 45 | 21 | 0 | 27.8 | 1.45 |
| Glasco | Ulster | D. B. Hendricks | 25 | 45 | 21 | — 8 | 21.5 | 2.45 |
| Minaville | Montgomery | D. S. Bussing | 23 | 46 | 21 | —20 | 20.0 | ..... |
| Middleburgh | Schoharie | Rev. S. W. Roe | 23 | 70 | 21 | — 8 | 27.3 | 1.30 |
| Canton | St. Lawrence | Leslie A. Lee | 23 | 50 | 21 | —28 | 18.6 | 2.40 |
| Gouverneur | ....do | C. H. Russell | 14 | 53 | 21 | —40 | 18.0 | 3.19 |
| North Hammond | ....do | C. A. Wooster | 23 | 50 | 21 | —27 | 21.1 | 2.31 |
| Fairfield Seminary | Herkimer | G. F. Sawyer | 23 | 40 | 21 | —27 | 18.2 | 2.18 |
| Cooperstown | Otsego | G. P. Keese | 23 | 45 | 21 | —23 | 21.6 | 1.76 |
| Lowville | Lewis | Rev. W. N. Irish | 25 | 42 | 21 | —35 | 18.0 | 3.32 |
| South Trenton | Oneida | Storrs Barrows | 23 | 48 | 21 | —24 | 20.2 | 2.00 |
| Oneida | Madison | S. Spooner, M. D | 23 | 50 | 21 | —14 | 27.2 | 3.79 |
| Cazenovia | ....do | Prof. W. Soule | 23 | 49 | 21 | —12 | 21.8 | 4.89 |
| Depauville | Jefferson | Henry Haas | 23 | 46 | 21 | —25 | 19.6 | 4.28 |
| Oswego | Oswego | W. S. Malcom | 31 | 44 | 21 | — 4 | 25.4 | 1.30 |
| Palermo | ....do | E. B. Bartlett | 23 | 42 | 21 | —19 | 21.0 | 4.20 |
| North Volney | ....do | J. M. Patrick | 23 | 48 | 21 | —15 | 23.2 | ..... |
| Waterburgh | Tompkins | D. Trowbridge | 25 | 48 | 21 | —10 | 23.7 | 1.19 |
| Nichols | Tioga | Robert Howell | 25 | 52 | 21 | —11 | 26.0 | ..... |
| Newark Valley | ....do | Rev. Samuel Johnson | 25 | 50 | 21 | —16 | 22.8 | 3.70 |
| Himrod's | Yates | G. D. Baker | 23 | 48 | 21 | —12 | 23.7 | 0.94 |
| Rochester | Monroe | G. P. Hachenberg, M. D | 31 | 50 | 21 | 5 | 29.0 | 2.05 |
| Little Genesee | Allegany | Daniel Edwards | 23, 24 | 44 | 21 | 20 | 22.6 | 3.02 |
| Angelica | ....do | C. P. Arnold | 22, 25 | 50 | 21 | —28 | 23.4 | 2.76 |
| Carlton | Orleans | M. P. Godfrey | 31 | 48 | 20 | 0 | 24.9 | 3.55 |
| Lockport | Niagara | B. W. Clark | 23, 31 | 49 | 21 | — 8 | 23.4 | 3.35 |
| Buffalo | Erie | William Ives | 23 | 52 | 21 | —10 | 25.6 | 2.04 |
| Jamestown | Chautauqua | S. G. Love | 31 | 46 | 21 | — 7 | 23.6 | 5.45 |
| NEW JERSEY. | | | | | | | | |
| Newark | Essex | W. A. Whitehead | 25 | 48 | 21 | — 1 | 29.0 | 2.13 |
| South Orange | ....do | W. J. Chandler, M. D | 25 | 50 | 21 | — 8 | 25.8 | 3.67 |
| Trenton | Mercer | E. R. Rock | 24 | 48 | 21 | — 1 | 31.5 | 3.34 |
| Moorestown | Burlington | T. J. Beans | 23 | 57 | 21 | — 1 | 28.7 | 2.50 |
| Rio Grande | Cape May | Mrs. J. R. Palmer | 25 | 58 | 21 | 1 | 32.6 | 1.23 |
| New Germantown | Hunterdon | A. B. Noll | 25 | 49 | 21 | — 6 | 26.0 | 2.01 |
| Readington | ....do | John Fleming | 25 | 50 | 21 | — 2 | 28.4 | ..... |
| Atco | Camden | H. A. Green | 23 | 59 | 21 | —12 | 20.9 | ..... |
| Vineland | Cumberland | J. Ingram, M. D | 23 | 55 | 21 | — 3 | 30.8 | 3.94 |
| Greenwich | ....do | Miss R. C. Sheppard | 23 | 52 | 21 | 1 | 32.2 | 2.12 |
| Alloways town | Salem | H. C. Perry | 23 | 53 | 21 | — 6 | 29.8 | 2.35 |
| PENNSYLVANIA. | | | | | | | | |
| Nyces | Pike | J. Grathwohl | 25 | 57 | 21 | —11 | 24.8 | 2.16 |
| Dyberry | Wayne | Theodore Day | 25 | 47 | 21 | —13 | 22.5 | 1.41 |
| Fallsington | Bucks | Ebenezer Hance | 23 | 54 | 21 | 0 | 29.6 | 2.40 |
| Germantown | Philadelphia | Thomas Meehan | 24 | 50 | 21 | — 3 | 29.3 | ..... |
| Philadelphia | ....do | Prof. J. A. Kirkpatrick | 24 | 47 | 21 | 6 | 33.0 | 1.87 |
| Horsham | Montgomery | Miss Anna Spencer | 8, 24 | 45 | 21 | — 2 | 28.1 | 0.70 |
| Plymouth Meeting | ....do | M. H. Corson | 24 | 45 | 21 | 0 | 28.3 | 0.90 |
| Egypt | Lehigh | Edward Kohler | 25 | 51 | 21 | — 5 | 27.1 | ..... |
| West Chester | Chester | George Martin, M. D | 8 | 45 | 21 | — 5 | 27.9 | 1.93 |

*Table showing the highest and lowest range of the thermometer, &c.*—Continued.

| State and station. | County. | Observer. | Date. | Maximum temperature. | Date. | Minimum temperature. | Mean temperature. | Rain and melted snow. |
|---|---|---|---|---|---|---|---|---|
| PENN.—Cont'd. | | | | | | | | |
| | | | | Deg. | | Deg. | Deg. | In. |
| Parkersville | Chester | F. Darlington, M. D | 11, 25 | 45 | 21 | — 1 | 28.2 | 1.85 |
| Factoryville | Luzerne | Rodman Sisson | 23 | 48 | 21 | — 9 | 25.3 | 1.27 |
| Reading | Berks | J. H. Raser | 25 | 53 | 21 | 3 | 32.0 | 1.45 |
| Ephratah | Lancaster | W. H. Spera | 25 | 52 | 21 | — 6 | 28.2 | 2.10 |
| Do | do | W. F. Madlem | 25 | 47 | 21 | — 2 | 29.6 | ..... |
| Mount Joy | do | J. R. Hoffer, M. D | 24 | 55 | 21 | 4 | 31.8 | ..... |
| Tioga | Tioga | E. T. Bentley | 25 | 46 | 21 | —22 | 25.3 | 1.30 |
| Lewisburgh | Union | Prof. C. S. James | 25 | 45 | 21 | — 6 | 26.3 | 1.43 |
| Carlisle | Cumberland | W. H. Cook, M. D | 2, 12 | 47 | 21 | 1 | 28.2 | 1.40 |
| Mt. Rock | do | Jacob Lefever | 25 | 46 | 21 | — 3 | 26.4 | 1.02 |
| Fountain Dale | Adams | S. C Walker | 25 | 53 | 21 | — 3 | 29.3 | 1.21 |
| York S. Springs | do | J. H. Marsden, M. D | 25 | 52 | 21 | — 3 | 31.1 | 0.80 |
| Grampian Hills | Clearfield | Elisha Fenton | 23, 25 | 49 | 21 | —18 | 20.9 | 2.00 |
| Greensburgh | Westmoreland | J. M. L. Stump | 25 | 68 | 21 | —14 | 30.0 | 1.83 |
| Franklin | Venango | Rev. M. A. Tolman | 31 | 48 | 21 | —10 | 24.5 | 2.86 |
| Connellsville | Fayette | John Taylor | 31 | 68 | 21 | —14 | 29.4 | ..... |
| Tarentum | Allegheny | J. Cummings | 23, 25 | 56 | 21 | —10 | ..... | ..... |
| Pittsburgh | do | George Albree | 31 | 58 | 21 | — 2 | 31.0 | ..... |
| Allegheny | do | B. Feicht, M. D | 31 | 65 | 21 | — 4 | 30.9 | 1.20 |
| Greenville | Mercer | J. B. Packard | 31 | 51 | 21 | —11 | 24.5 | 3.15 |
| Newcastle | Lawrence | E. M. McConnell | 23 | 62 | 21 | —10 | 26.3 | 1.40 |
| Beaver | Beaver | Rev. R. T. Taylor | 23 | 62 | 21 | — 4 | 29.7 | ..... |
| Cannonsburgh | Washington | William Smith, D.D | 25 | 60 | 21 | —19 | 28.6 | 1.60 |
| DELAWARE. | | | | | | | | |
| Milford | Kent | R. H. Gilman | 23 | 62 | 21 | — 4 | 32.8 | 2.90 |
| Dover | do | J. H. Bateman | 23 | 60 | 21 | 0 | 32.3 | 2.30 |
| MARYLAND. | | | | | | | | |
| Woodlawn | Cecil | J. O. McCormick | 24 | 52 | 21 | — 4 | 28.6 | 1.56 |
| Fallston | Harford | G. G. Curtis | 24 | 50 | 21 | — 4 | 29.4 | 1.62 |
| Woodstock College | Baltimore | Rev. A. X. Valente | 8 | 48 | 21 | — 5 | 28.1 | 1.51 |
| Annapolis | Anne Arundel | W. R. Goodman | 8 | 56 | 21 | 0 | 35.9 | 2.46 |
| St. Inigoes | St. Mary's | J. F. Elliott | 25 | 62 | 21 | 6 | 36.2 | 2.40 |
| Sam's Creek | Carroll | F. J. Devilbiss | 25 | 62 | 21 | — 2 | 31.3 | 1.50 |
| Mt. St. Mary's | Frederick | Prof. C. H. Jourdan | 25 | 50 | 21 | — 1 | 29.6 | 1.01 |
| Frederick | do | J. K. Hanshew | 26 | 54 | 21 | 3 | 32.5 | 0.96 |
| Cumberland | Alleghany | E. T. Shriver | 25 | 55 | 21 | — 1 | 30.3 | ..... |
| DIST. COLUMBIA. | | | | | | | | |
| Washington | Washington | ..... | 8 | 54 | 21 | 5 | 35.0 | 1.59 |
| VIRGINIA. | | | | | | | | |
| Johnsontown | Northampton | C. R. Moore | 25 | 66 | 21 | 9 | 38.7 | 2.20 |
| Capeville | do | Emma C. Townsend | 25 | 68 | 21 | 12 | 41.5 | ..... |
| Hampton | Elizab'th City | J. M. Sherman | 25 | 72 | 21 | 9 | 40.2 | 2.05 |
| Surry C. H. | Surry | B. W. Jones | 26, 31 | 74 | 21 | 5 | 40.8 | 2.50 |
| Comorn | King George | E. T. Tayloe | 25 | 64 | 21 | 1 | 34.2 | ..... |
| Vienna | Fairfax | H. C. Williams | 24 | 62 | 21 | — 2 | 33.9 | 2.20 |
| Do | do | G. A. Bowman | 6, 10 | 54 | 16 | 18 | 32.8 | ..... |
| Accotink | do | C. Gillingham | 24 | 56 | 21 | — 1 | 31.5 | 1.53 |
| Near Vienna | do | R. Robey | 25 | 76 | 21 | — 6 | 31.2 | 0.69 |
| Piedmont | Fauquier | F. Williams | 18 | 60 | 21 | — 4 | 30.9 | 2.00 |
| Piedmont Station | do | W. A. Martin | 25 | 59 | 21 | — 3 | 31.6 | 0.35 |
| Keswick Station | Albemarle | Capt. D. B. Horn | 18, 25 | 62 | 21 | 1 | 34.1 | ..... |
| Mt. Solon | Augusta | J. T. Clark, M. D | 31 | 64 | 21 | — 2 | 32.8 | 0.50 |
| Lynchburgh | Bedford | C. J. Meriwether | 25, 26 | 60 | 21 | 9 | 38.2 | 1.30 |
| Wytheville | Wythe | Rev. J. A. Brown | 31 | 68 | 21 | — 3 | 34.2 | 0.60 |
| WEST VIRGINIA. | | | | | | | | |
| Weston | Lewis | Benjamin Owens | 23, 25 | 62 | 21 | —11 | 32.3 | ..... |
| Cabell C. H. | Cabell | C. L. Roffe | 25 | 62 | 21 | 0 | 34.2 | ..... |
| NORTH CAROLINA. | | | | | | | | |
| Tarborough | Edgecombe | R. H. Austin | 25, 27 | 70 | 31 | 6 | 39.5 | 1.50 |
| Oxford | Granville | W. R. Hicks, M. D | 18 | 62 | 21 | 9 | 38.4 | 1.50 |

*Table showing the highest and lowest range of the thermometer, &c.*—Continued.

| State and station. | County. | Observer. | Date. | Maximum temperature. | Date. | Minimum temperature. | Mean temperature. | Rain and melted snow. |
|---|---|---|---|---|---|---|---|---|
| N. C.—Continued. | | | | *Deg.* | | *Deg.* | *Deg.* | *In.* |
| Fayetteville | Cumberland | G. W. Lawrence | 26 | 74 | 21 | 16 | 44.0 | 1.90 |
| Albemarle | Stanley | F. J. Kron | 26 | 74 | 6, 9 | 5 | 39.0 | 1.17 |
| Statesville | Iredell | T. A. Alison | 25,26,31 | 60 | 21 | 5 | 35.2 | 1.25 |
| Asheville | Buncombe | E. J. Aston | 25 | 65 | 21 | 4 | 37.1 | ..... |
| Do | do | J. T. E. Hardy, M. D. | 25, 30 | 70 | 21 | 2 | 38.1 | ..... |
| SOUTH CAROLINA. | | | | | | | | |
| Gowdeysville | Union | Charles Petty | 26 | 70 | 6 | 12 | 44.0 | 2.17 |
| Greenville C. H | Greenville | L. Gibbon | 18, 19 | 70 | 21 | 16 | 42.7 | 3.40 |
| GEORGIA. | | | | | | | | |
| Berne | Camden | H. L. Hillyer | 23 | 74 | 6 | 25 | 49.1 | 1.55 |
| St. Mary's | do | Ebenezer Barker | 24, 26 | 76 | 6 | 29 | 52.9 | 2.65 |
| Trader's Hill | Charlton | Dr. F. M. Smith | 24, 27 | 78 | 6 | 26 | 53.5 | ..... |
| Quitman | Brooks | J. L. Cutler | 31 | 77 | 6 | 27 | 53.5 | 3.10 |
| Macon | Bibb | S. P. Sanford | 26 | 74 | 21 | 19 | 47.8 | 6.30 |
| Atlanta | Fulton | Charles Deckner | 31 | 72 | 5, 21 | 14 | 44.0 | 0.77 |
| La Fayette | Walker | A. R. McCutchen | 25 | 70 | 5, 6, 21 | 12 | 40.6 | 2.49 |
| ALABAMA. | | | | | | | | |
| Moulton | Lawrence | T. M. Peters | 29 | 69 | 5 | 16 | 44.0 | 1.50 |
| Selma | Dallas | Dr. Fahs and Miss R. B. Deans. | 25 | 76 | 5 | 23 | 52.3 | 2.90 |
| Carlowville | do | H. L. Alison | 30 | 76 | 5 | 19 | 50.0 | 3.61 |
| Havana | Hale | H. Tutwiler, LL. D | 26 | 74 | 5 | 16 | 49.0 | 2.35 |
| FLORIDA. | | | | | | | | |
| Near Port Orange | Volusia | S. W. Chamberlin | 27 | 76 | 7 | 32 | 56.5 | 3.98 |
| Jacksonville | Duvall | A. S. Baldwin, M. D | 2 | 88 | 6 | 29 | 57.0 | 2.15 |
| Picolata | St. John's | C. F. Powell | 23 | 79 | 6 | 37 | 59.4 | ..... |
| Tampa | Hillsborough | W. F. White | 23, 25, 26, 30 | 78 | 21 | 31 | 57.3 | 3.00 |
| Wellborn | Suwannee | Geo. R. Thralls | 11, 30 | 78 | 21 | 30 | 57.1 | 2.30 |
| Newport | Wakulla | Chas. Beecher | 8 | 74 | 21 | 28 | 51.3 | ..... |
| TEXAS. | | | | | | | | |
| Clarksville | Red River | Rev. John Anderson | 30 | 77 | 20 | 21 | 49.0 | ..... |
| Near Clarksville | do | Allen Martin | 30 | 73 | 20 | 19 | 43.9 | 0.39 |
| Houston | Harris | Miss E. H. Boxter | 18 | 84 | 4 | 28 | 56.5 | ..... |
| Sand Fly | Bastrop | F. S. Wade | 31 | 82 | 5 | 23 | 51.5 | 0.35 |
| Bluff | Fayette | Joseph Fietsom | 22 | 77 | 4 | 24 | 52.8 | 0.50 |
| Clinton | DeWitt | A. C. White, M. D | 25 | 80 | 5 | 24 | 53.1 | 0.50 |
| Austin | Travis | J. Van Nostrand | 19 | 78 | 4 | 22 | 49.9 | 1.00 |
| Clear Creek | Galveston | George N. Leoni | 19 | 80 | 4 | 29 | 53.5 | 2.60 |
| LOUISIANA. | | | | | | | | |
| New Orleans | Orleans | R. W. Foster | 25, 31 | 80 | 5, 6 | 29 | ..... | 3.26 |
| Ponchatoula | Livingston | H. Collins | 23 | 81 | 5 | 24 | 55.6 | 3.98 |
| MISSISSIPPI. | | | | | | | | |
| Columbus | Lowndes | J. F. Tarrant | 18, 23, 30 | 74 | 6 | 21 | 46.2 | 1.76 |
| Marion Station | Lauderdale | T. W. Florer, M. D | 25 | 78 | 5 | 18 | 46.0 | 1.90 |
| Holly Springs | Marshall | T. B. Coleman | 25, 31 | 70 | 21 | 16 | 39.1 | 4.10 |
| Grenada | Grenada | J. L. Payne | 7 | 79 | 6 | 18 | 46.4 | 2.20 |
| Near Brookhaven | Lawrence | Mrs. W. E. Keenan | 30 | 80 | 5 | 19 | 52.3 | 1.40 |
| ARKANSAS. | | | | | | | | |
| Pocahontas | Randolph | J. P. Martin, M. D | 30 | 74 | 4 | 8 | 33.6 | 1.80 |
| Mineral Spring | Hempstead | Harmon Bishop | 31 | 70 | 4 | 14 | 43.9 | 0.75 |
| TENNESSEE. | | | | | | | | |
| Elizabethton | Carter | C. H. Lewis | 31 | 72 | 21 | — 6 | 36.4 | 0.85 |
| Greeneville | Greene | S. S. & Rev. W. S. Doak | 30 | 70 | 21 | — 1 | 35.5 | 0.81 |
| Knoxville | Knox | J. K. Payne | 31 | 68 | 21 | 6 | 36.9 | 3.27 |

*Table showing the highest and lowest range of the thermometer, &c.*—Continued.

| State and station. | County. | Observer. | Date. | Maximum temperature. | Date. | Minimum temperature. | Mean temperature. | Rain and melted snow. |
|---|---|---|---|---|---|---|---|---|
| TENN.—Continued. | | | | | | | | |
| | | | | Deg. | | Deg. | Deg. | In. |
| Clearmont | Warren | T. P. Wright | 30 | 69 | 21 | 6 | 38.9 | 2.86 |
| Austin | Wilson | P. B. Calhoun | 30, 31 | 72 | 4, 20, 21 | 8 | 39.2 | 3.44 |
| Clarksville | Montgomery | Prof. W. M. Stewart | 30 | 69 | 21 | 3 | 36.0 | 2.54 |
| Trenton | Gibson | W. T. Grigsby | 30 | 73 | 4, 20 | 13 | 38.6 | 2.50 |
| La Grange | Fayette | W. E. Franklin, M. D. | 30 | 70 | 21 | 13 | 40.0 | 2.20 |
| KENTUCKY. | | | | | | | | |
| Pine Grove | Clark | S. D. Martin, M. D. | 31 | 68 | 21 | — 8 | 30.8 | 4.18 |
| Shelby City | Boyle | Howard Shriver | 30 | 66 | 21 | — 6 | 34.6 | 3.03 |
| Near Louisville | Jefferson | Mrs. L. Young | 30 | 64 | 21 | — 3 | 31.8 | 3.05 |
| Blandville | Ballard | E. W. Horr | 30 | 70 | 20, 21 | 2 | 34.6 | 3.55 |
| OHIO. | | | | | | | | |
| Salem | Columbiana | J. E. Pollock | 31 | 57 | 21 | —18 | 25.1 | 1.50 |
| Martin's Ferry | Belmont | C.R.&MarthaB.Shreve | 23 | 63 | 21 | —12 | 29.2 | ..... |
| Painesville | Lake | E. J. Ferris | 31 | 55 | 21 | — 8 | 25.5 | 3.80 |
| Adams's Mills | Muskingum | C. A. Stilwell | 31 | 58 | 21 | —14 | 26.7 | 2.85 |
| Pennsville | Morgan | T. J. Bingham | 23 | 63 | 21 | —14 | 28.6 | 2.20 |
| Gallipolis | Gallia | A. P. Rodgers | 31 | 70 | 21 | — 8 | 30.8 | 1.38 |
| Oberlin | Lorain | L. Herrick | 31 | 56 | 21 | —18 | 24.4 | 1.63 |
| Sandusky | Erie | Thomas Neill | 30 | 47 | 20 | — 3 | 25.5 | 1.68 |
| Carson | Huron | Mrs. M. M. Marsh | 3 | 58 | 20, 21, 28 | — 6 | 29.2 | ..... |
| North Fairfield | ....do | O. Burrass | 30, 31 | 58 | 21 | —18 | 26.4 | 1.96 |
| Westerville | Franklin | Prof. J. Haywood | 23 | 55 | 21 | —16 | 26.8 | 2.16 |
| North Bass Island | Ottawa | Geo. R. Morton, M. D. | 23 | 51 | 21 | — 7 | 24.9 | 1.86 |
| Marion | Marion | H. A. True, M. D. | 30 | 54 | 21 | —17 | 24.8 | 2.52 |
| Hillsborough | Highland | J. McD. Mathews | 23 | 56 | 21 | — 7 | 28.5 | 3.06 |
| Kenton | Hardin | C. H. Smith, M. D | 31 | 65 | 21 | —13 | 25.5 | 1.75 |
| Bellefontaine | Logan | William Barringer | 31 | 56 | 21 | —12 | 25.0 | 2.45 |
| Urbana University | Champaign | M. G. Williams | 30 | 58 | 21 | —17 | 26.2 | 2.30 |
| Bethel | Clermont | G. W. Crane | 30 | 60 | 21 | —15 | 27.3 | 3.37 |
| Farmer | Defiance | A. C. Irwin | 23 | 56 | 21 | —18 | 23.8 | 2.60 |
| Carthagena | Mercer | Prof. W. R. Mueller | 23, 31 | 62 | 21 | —10 | 28.7 | 3.45 |
| Jacksonburgh | Butler | J. B. Owsley, M. D | 23, 31 | 58 | 21 | — 8 | 28.2 | 2.95 |
| Oxford | ....do | R. W. McFarland | 23 | 58 | 21 | —12 | 26.8 | 3.60 |
| Mount Auburn Ins. | Hamilton | Prof. I. H. White | 31 | 68 | 21 | — 6 | 29.5 | 3.38 |
| Cumminsville | ....do | J. H. Shields | 30 | 47 | 21 | — 8 | 27.6 | 4.65 |
| Cincinnati | ....do | G. W. Harper | 31 | 61 | 21 | — 5 | 30.5 | 3.31 |
| Do | ....do | R. C. Phillips | 23 | 61 | 21 | — 3 | 28.8 | 3.90 |
| College Hill | ....do | J. W. Hammitt | 23, 30, 31 | 56 | 21 | —10 | 28.1 | 3.11 |
| MICHIGAN. | | | | | | | | |
| Alpena | Alpena | J. W. Paxton | 23 | 35 | 20 | — 9 | 20.0 | 1.16 |
| Detroit | Wayne | F. W. Higgins | 23 | 52 | 21 | —22 | 22.3 | 1.56 |
| Monroe City | Monroe | Thomas Whelpley | 23 | 52 | 21 | —10 | 27.7 | 0.76 |
| State Agr. College | Ingham | Prof. R. C. Kedzie | 23 | 51 | 20 | —23 | 21.2 | 1.76 |
| Litchfield | Hillsdale | R. Bullard | 23 | 46 | 20 | —19 | 21.1 | 2.18 |
| Olivet College | Eaton | Prof. A. F. Kemp | 23 | 48 | 20 | —17 | 20.5 | 2.55 |
| Grand Rapids | Kent | E. S. Holmes, D. D. S. | 23 | 48 | 20 | —12 | 23.1 | 2.14 |
| Northport | Leelenaw | Rev. G. N. Smith | 23 | 43 | 20 | — 6 | 21.0 | ..... |
| Benzonia | Benzie | William Wilson | 23 | 38 | 20 | — 1 | 21.1 | 4.70 |
| Ontonagon | Ontonagon | E. Ellis, M. D. | 16 | 34 | 20 | —14 | 11.5 | 2.05 |
| INDIANA. | | | | | | | | |
| Fort Wayne | Allen | R. S. Robertson | 23 | 53 | 21 | —15 | 24.6 | 2.75 |
| Mt. Carmel | Franklin | J. A. Applegate and daughter. | 30, 31 | 56 | 21 | — 6 | 28.6 | 2.45 |
| Aurora | Dearborn | George Sutton, M. D. | 31 | 60 | 21 | — 9 | 23.9 | 3.20 |
| Vevay | Switzerland | C. G. Boerner | 30 | 64 | 21 | — 7 | 30.5 | 2.75 |
| Knightstown | Rush | D. Deem | 31 | 57 | 21 | —15 | 26.0 | 2.11 |
| Beech Grove | ....do | William S. Clark | 30 | 58 | 21 | —12 | 26.2 | 2.85 |
| Livonia | Washington | J. K. Howard | 30 | 62 | 21 | — 8 | 26.4 | 2.75 |
| Laconia | Harrison | Adam Crozier | 30 | 68 | 21 | — 2 | 31.2 | 3.69 |
| Steam Corner | Fountain | B. C. Williams, M. D. | 30 | 56 | 21 | — 7 | 23.9 | 2.80 |
| Merom | Sullivan | Thomas Holmes | 30 | 62 | 21 | — 1 | 28.5 | 2.90 |
| New Harmony | Posey | John Chappellsmith | 30 | 64 | 21 | 2 | 31.2 | 2.23 |

*Table showing the highest and lowest range of the thermometer, &c.*—Continued.

| State and station. | County. | Observer. | Date. | Maximum temperature. | Date. | Minimum temperature. | Mean temperature. | Rain and melted snow. |
|---|---|---|---|---|---|---|---|---|
| ILLINOIS. | | | | | | | | |
| | | | | *Deg.* | | *Deg.* | *Deg.* | *In.* |
| Near Chicago | Cook | Samuel Brookes | 11, 12 | 46 | 5 | − 8 | 21. 7 | ..... |
| Evanston | ....do | Prof. O. Marcy | 23 | 44 | 5 | −10 | 19. 7 | 1. 30 |
| Marengo | McHenry | J. W. James | 11 | 40 | 5 | −16 | 16. 1 | 1. 93 |
| Aurora | Kane | A. Spaulding, M. D | 11, 12, 30 | 44 | 21 | −15 | 18. 9 | 2. 18 |
| Louisville | Clay | D. H. Chase, M. D | 30 | 64 | 21 | − 2 | 28. 0 | 2. 35 |
| Belvidere | Boone | J. B. Morse | 11 | 43 | 20 | −21 | 15. 6 | 1. 96 |
| Decatur | Macon | Timothy Dudley | 7 | 46 | 5 | − 6 | 23. 6 | 1. 15 |
| Wyanet | Bureau | E. S. & Miss I. G. Phelps | 12 | 48 | 21 | −13 | 19. 6 | 3. 98 |
| Tiskilwa | ....do | Verry Aldrich | 11 | 46 | 21 | −11 | 21. 1 | ..... |
| Hennepin | Putnam | Ethan Osborn | 12 | 48 | 20, 21 | −12 | 21. 5 | 1. 90 |
| Dubois | Washington | W. C. Spencer | 30 | 68 | 21 | − 4 | 28. 1 | 1. 65 |
| Peoria | Peoria | Fred. Brendel | 30 | 50 | 4, 5 | − 6 | 24. 4 | 2. 04 |
| Havana | Mason | Jos. Cochrane | 30 | 56 | 4 | − 7 | 23. 5 | 2. 40 |
| Galesburgh | Knox | Prof. W. Livingston | 30 | 43 | 4 | − 9 | 21. 0 | 1. 60 |
| Waterloo | Monroe | Chas. Jozefé | 30 | 62 | 4, 20 | − 3 | 26. 3 | 1. 55 |
| Manchester | Scott | Dr. J. & Mrs. M. Grant | 29 | 58 | 4 | − 4 | 24. 9 | 2. 70 |
| Near Manchester | ....do | Peter Murray | 30 | 56 | 4 | − 5 | 25. 1 | ..... |
| Mt. Sterling | Brown | Rev. A. Duncan | 30 | 56 | 4, 27 | − 2 | 26. 5 | 2. 25 |
| Oquawka | Henderson | H. N. Patterson | 11 | 53 | 4 | − 8 | 23. 0 | 1. 99 |
| Augusta | Hancock | S. B. Mead | 30 | 59 | 4 | − 9 | 23. 4 | 1. 31 |
| Warsaw | ....do | B. Whitaker | 30 | 55 | 4 | − 8 | 23. 4 | 1. 44 |
| Quincy | Adams | F. J. Heance, C. E | 30 | 58 | 4 | − 5 | 24. 6 | 1. 50 |
| WISCONSIN. | | | | | | | | |
| Sturgeon Bay | Door | Mrs. C. C. Pinney | 30 | 38 | 20 | −15 | 14. 9 | 1. 67 |
| Manitowoc | Manitowoc | Jacob Lups | 30 | 40 | 5, 20 | −14 | 16. 3 | 2. 04 |
| Hingham | Sheboygan | J. de Lyser | 12, 23, 30 | 40 | 5, 20 | −13 | 16. 1 | ..... |
| Milwaukee | Milwaukee | J. A. Lapham, LL. D | 23 | 47 | 5 | −13 | 17. 8 | 2. 03 |
| Geneva | Walworth | W. H. Whiting | 11 | 43 | 5 | −17 | 15. 5 | 1. 20 |
| Waupaca | Waupaca | H. C. Mead | 3, 30 | 40 | 27 | −18 | 15. 6 | ..... |
| Embarrass | ....do | E. E. Breed | 11 | 40 | 20 | −27 | 9. 6 | 2. 54 |
| Edgerton | Rock | H. J. Shints | 11 | 44 | 20 | −14 | 17. 0 | ..... |
| Rocky Run | Columbia | W. W. Curtis | 11 | 42 | 20 | −26 | 14. 2 | 2. 38 |
| Madison | Dane | W. W. Daniells | 11 | 39 | 5 | −15 | 14. 3 | 1. 15 |
| Mosinee | Marathon | J. O'Donoghue | 11 | 39 | 20 | −25 | 9. 3 | 2. 94 |
| Baraboo | Sauk | M. C. Waite | 11 | 38 | 20 | −22 | 15. 3 | 5. 75 |
| New Lisbon | Juneau | J. L. Dungan | 12 | 46 | 27 | −17 | 14. 2 | ..... |
| Bayfield | Bayfield | Andrew Tate | 11 | 40 | 26 | −22 | 8. 6 | ..... |
| MINNESOTA. | | | | | | | | |
| Beaver Bay | Lake | C. Wieland | 10 | 46 | 20, 27 | −20 | 10. 6 | 0. 98 |
| Beaver | Winona | J. K. P. Winters | 11 | 36 | 27 | −22 | 6. 9 | ..... |
| Afton | Washington | A. L. Roe | 10 | 42 | 4 | −27 | 11. 5 | 1. 90 |
| Saint Paul | Ramsey | Rev. A. B. Peterson | 6 | 43 | 5 | −24 | 9. 1 | 0. 87 |
| Minneapolis | Hennepin | William Cheney | 6 | 41 | 27 | −29 | 5. 8 | 1. 12 |
| Sibley | Sibley | C. W. & E. W. Woodbury | 6 | 38 | 4 | −21 | 7. 5 | 0. 43 |
| Litchfield | Meeker | H. L. Wadsworth | 11 | 34 | 4, 27 | −20 | 4. 4 | ..... |
| New Ulm | Brown | Charles Roos | 10 | 40 | 4 | −18 | 10. 0 | ..... |
| Oak Lake | Becker | D. Pyle, M. D | 10 | 35 | 25 | −20 | 6. 2 | ..... |
| IOWA. | | | | | | | | |
| Monticello | Jones | Prof. J. E. Jones | 11 | 45 | 20 | −17 | 14. 9 | 2. 38 |
| Durant | Cedar | F. A. Ross | 6 | 44 | 5, 27 | −14 | 16. 4 | 3. 30 |
| West Branch | ....do | A. M. Russell | 6 | 46 | 27 | −17 | 16. 9 | 5. 90 |
| Guttenberg | Clayton | J. P. Dickerson | 6 | 42 | 27 | −20 | 12. 2 | ..... |
| Mount Vernon | Linn | Prof. A. Collins | 6 | 44 | 5 | −16 | 15. 4 | ..... |
| Iowa City | Johnson | T. S. Parvin | 6 | 44 | 27 | −13 | 15. 8 | 2. 67 |
| Fort Madison | Lee | D. McCready | 30 | 49 | 4 | − 8 | 22. 2 | 1. 39 |
| Independence | Buchanan | George Warne, M. D | 2, 6 | 41 | 27 | −20 | 13. 2 | 1. 55 |
| Near Independence | ....do | Mrs. D. B. Wheaton | 6 | 40 | 27 | −20 | 11. 9 | 1. 20 |
| Cresco | Howard | Gregory Marshall | 6, 30 | 36 | 5, 27 | −23 | 8. 7 | 0. 86 |
| Rockford | Floyd | H. Wadey | 30 | 38 | 27 | −12 | 14. 9 | 2. 05 |
| Algona | Kossuth | J. H. Warren | 11 | 44 | 4 | −17 | 10. 9 | ..... |
| Fontanelle | Adair | A. F. Bryant | 6 | 55 | 27 | −15 | 17. 3 | ..... |
| Sac City | Sac | D. B. Nelson | 6 | 42 | 4 | −18 | 12. 8 | 4. 40 |
| Council Bluffs | Pottawattomie | Benjamin Talbot | 6 | 49 | 4 | − 9 | 18. 6 | 0. 85 |
| Do | ....do | D. R. Witter | 10 | 55 | 27 | −27 | 17. 3 | ..... |
| Logan | Harrison | J. T. Stern | 6 | 50 | 4, 27 | −14 | 17. 4 | 1. 30 |

*Table showing the highest and lowest range of the thermometer, &c.*—Continued.

| State and station. | County. | Observer. | Date. | Maximum temperature. | Date. | Minimum temperature. | Mean temperature. | Rain and melted snow. |
|---|---|---|---|---|---|---|---|---|
| MISSOURI. | | | | *Deg.* | | *Deg.* | *Deg.* | *In.* |
| St. Louis University | St. Louis | A. Averbeck | 30 | 64 | 4 | 2 | 31.3 | 1.05 |
| Hematite | Jefferson | J. M. Smith | 30 | 71 | 21 | − 7 | 31.7 | 1.20 |
| Rolla | Phelps | H. Ruggles | 30 | 70 | 4 | 0 | 29.9 | 1.45 |
| Jefferson City | Cole | N. De Wyl | 30 | 60 | 4 | − 2 | 28.1 | ..... |
| North Springfield | Greene | R. H. McCord | 30 | 66 | 4 | − 6 | 28.0 | 0.70 |
| Mount Vernon | Lawrence | Wyatt Harris | 30 | 66 | 4 | − 2 | 29.7 | 0.72 |
| Kansas City | Jackson | S. W. Salisbury | 9 | 56 | 27 | 0 | 28.9 | 0.75 |
| Nevada | Vernon | P. J. Bond | 30 | 62 | 4 | − 3 | 28.3 | 3.00 |
| Oregon | Holt | William Kaucher | 6 | 56 | 4 | −10 | 21.9 | 2.42 |
| Corning | ....do | H. Martin | 6 | 54 | 27 | −11 | 20.5 | 0.65 |
| Saint Joseph | Buchanan | H. Bullard | 6 | 54 | 4 | − 2 | 26.8 | 0.76 |
| KANSAS. | | | | | | | | |
| Olathe | Johnson | Watts Beckwith | 6 | 58 | 4, 27 | − 6 | 23.8 | 0.20 |
| Paola | Miami | L. D. Walrad | 30 | 54 | 4 | − 4 | 26.9 | 1.66 |
| Baxter Springs | Cherokee | William Hyland | 30 | 60 | 4 | 0 | 30.3 | 4.50 |
| Leavenworth | Leavenworth | Dr. J. Stayman | 6 | 62 | 27 | − 8 | 23.2 | 1.28 |
| Atchison | Atchison | Dr. H. B. and Miss M. Horn. | 6 | 60 | 27 | −14 | 22.7 | 1.65 |
| Williamstown | Jefferson | J. M. Cotton | 11 | 68 | 4 | − 8 | 24.4 | 1.21 |
| Near Williamstown | ....do | ....do | 30 | 54 | 4 | − 6 | 27.1 | 1.21 |
| Lawrence | Douglass | F. H. Snow | 6 | 58 | 4 | − 6 | 24.9 | 1.12 |
| Williamsburgh | Franklin | D. Fogle | 6 | 57 | 4 | − 5 | 25.6 | 0.80 |
| Holton | Jackson | J. Watters, M. D. | 6 | 62 | 27 | −10 | 22.8 | ..... |
| Le Roy | Coffey | J. G. Shoemaker | 30 | 56 | 20 | − 6 | 29.2 | 1.45 |
| Manhattan | Riley | Prof. B. F. Mudge | 15 | 53 | 27 | − 6 | 24.7 | 0.35 |
| Council Grove | Morris | A. Woodworth, M. D. | 6 | 54 | 4 | − 6 | 25.8 | 0.60 |
| Holden | Sedgwick | A. G. Richardson | 12 | 50 | 4, 27 | − 3 | 24.3 | 0.40 |
| NEBRASKA. | | | | | | | | |
| De Soto | Washington | Charles Seltz | 6 | 47 | 4, 27 | −13 | 16.8 | 1.38 |
| Bellevue | Sarpy | Mrs. E. E. Caldwell | 6 | 53 | 27 | −19 | 17.5 | 1.01 |
| Emerson | Otoe | William Dunn | 6 | 50 | 4 | −16 | 16.1 | 1.80 |
| Omaha Agency | Blackbird | Rev. William Hamilton | 6,11,15 | 50 | 4 | −11 | 18.2 | 1.15 |
| Santee Agency | L'Eau qui Court | G. S. Truman | 6 | 47 | 4 | −15 | 15.4 | 0.60 |
| UTAH. | | | | | | | | |
| Coalville | Summit | Thomas Bullock | 28 | 45 | 10, 11 | − 6 | 27.7 | 1.98 |
| COLORADO. | | | | | | | | |
| Denver City | Arapahoe | William N. Byers | 9 | 55 | 19 | − 2 | 31.3 | 0.77 |
| Fountain | El Paso | C. I. Croft | 6 | 70 | 14, 22, 23 | 12 | 34.5 | 0.09 |
| Colorado Springs | ....do | E. S. Nettleton | 6 | 60 | 17, 22 | 7 | 31.6 | 0.33 |
| NEW BRUNSWICK. | | | | | | | | |
| St. John | St. John | Gilbert Murdock | 24 | 45 | 21 | −10 | 20.4 | 2.50 |
| NOVA SCOTIA. | | | | | | | | |
| Wolfville | ..... | D. F. Higgins | 23 | 49 | 21 | 0 | 25.0 | 2.06 |

# NOTES OF THE WEATHER—DECEMBER, 1871.

*Mount Desert, Me.*—A gale in the night blew down chimneys and carried off the snow 23d.

*Montville, Me.*—Penobscot River frozen for the first time 1st; snow during the night 7th.

*West Waterville, Me.*—Sleet, hail, and rain 4th; snow 7th, 10th, 14th, 23d, 27th, and 29th.

*Oxford, Me.*—Coldest day in four years 21st.

*Lisbon, Me.*—Teams cross Androscoggin River on ice about nine days sooner than usual for the last ten years 1st. Fine display of aurora borealis in the evening 8th. First sleighing 19th.

*Standish, Me.*—Snow fell on seven days, and rain on twelve; warm days 24th and 25th.

*Stratford, N. H.*—Wells low; some small streams freezing and drying up; mills doing but little, some have stopped. Snow on eighteen days, seventeen inches in all.

*Tamworth, N. H.*—A very cold December. Snow enough for good sleighing; the ground is frozen two feet deep. Swamps are quite dry, wells and streams are low.

*Craftsbury, Vt.*—A month remarkable for sudden changes. Snow fell on twenty days, and rain on three.

*Woodstock, Vt.*—Ice in the river twenty inches thick 22d; wells and streams low.

*Near St. Albans, Vt.*—Heavy wind during the night 23d; poor sleighing 31st.

*West Charlotte, Vt.*—First three days beautiful, with the haze of Indian summer; month unusually cold.

*Castleton, Vt.*—Thunder-storm south and southeast 23d; have been but few phenomena this month; very cloudy.

*New Bedford, Mass.*—No ice in the river; no snow on the ground; very little frost; roads muddy 31st.

*Cambridge, Mass.*—Rain 4th, 23d, and 26th; snow on nine days, not enough altogether for two days' sleighing.

*North Billerica, Mass.*—Snow nearly gone; ice-cutting suspended; streams pretty full 31st.

*Newport, R. I.*—Half-inch of snow, the first of the season, 7th; a gale from the south, and copious showers from 1 to 4 a. m. 24th.

*Moriches, N. Y.*—Remarkably mild and beautiful 24th.

*Argyle, N. Y.*—The month noted for violent changes of temperature.

*Brooklyn, N. Y.*—A singular storm, commencing with snow, changing to sleet, hail, and rain in succession, 29th; stars visible 21 evenings.

*Glasco, N. Y.*—Hudson closed from Albany to Rondout 6th; thunder and lightning 31st.

*Middleburgh, N. Y.*—The afternoon and night of the 23d a gale of "hot south wind" carried off 8 inches of snow, broke up the ice 10 inches thick in Schoharie River, and raised the water very high, causing serious damage.

*Cooperstown, N. Y.*—Otsego Lake closed 21st; a very changeable month—severely cold and very mild; good sleighing for a week, in the middle of the month; none on the 31st.

*Gouverneur, N. Y.*—Heavy thunder, sharp lightning, and high wind at 4 p. m. 23d.

*Depauville, N. Y.*—Twenty rainy days during the month.

*Newark Valley, N. Y.*—Thunder-shower 6 p. m. 31st.

*Buffalo, N. Y.*—The coldest December in thirteen years, with more than the average of high winds.

*South Orange, N. J.*—Ice six inches thick 3d; first sleighing 20th; sleighing gone 24th; frost all out of the ground 27th.

*Moorestown, N. J.*—"Stern, straight-along winter through the month."

*Vineland, N. J.*—Month cold and severe.

*Fallsington, Pa.*—Delaware River closed at Trenton, N. J., 5th; rain-storm 23d; Delaware River broke up at Trenton, N. J., 24th; a very cold month.

*Tioga, Pa.*—Diffuse lightning; thunder in the distance 31st; many springs and wells are dry that never were known to fail before.

*York Sulphur Springs, Pa.*—Month remarkably dry.

*Greensburgh, Pa.*—Coldest day in fifteen years 21st; thermometer 68°, the warmest Christmas for fifteen years, 25th; first thunder and lightning since October 31st.

*Tarentum, Pa.*—Allegheny River broke up very abruptly, the ice eight inches thick, 26th; coal and lumber men have sustained much damage.

*New Castle, Pa.*—Lightning, with loud and prolonged thunder, 31st.

*Beaver, Pa.*—The coldest night in five years 21st; lightning and heavy thunder 31st; month very dry.

*Cannonsburgh, Pa.*—Thunder, lightning, rain, and hail 31st.

*Woodlawn, Md.*—Susquehanna River closed at Port Deposit for the month 2d; light rain, freezing as it fell, 29th and 30th; melted away 31st.

*Fallston, Md.*—The lowest range of the thermometer in the last seven years 21st; the dryest month since February; thickest ice eight inches.

*Sam's Creek, Md.*—Month dry, water failing.

*Emmittsburgh, Md.*—The coldest day recorded for several years 21st.

*Caperville, Va.*—The coldest day since December 16th, 1866, 21st.

*Surry C. H., Va.*—A remarkable month, rainy, wet, and very changeable; changes sudden; temperature either extremely cold or warm.

*Accotink, Va.*—Very little rain or snow during the month.

*Wytheville, Va.*—Very little rain during the month; many springs and wells dry; wheat suffering from hard freezing, having no snow for protection.

*Tarborough, N. C.*—Snow three inches 1st.

*Oxford, N. C.*—Light snow 1st; snow followed by rain 3d.

*Fayetteville, N. C.*—Snow-fall of November 30th continued to 10 a. m. 1st, measuring nine inches, the heaviest fall of snow since 1855.

*Albemarle, N. C.*—Thunder in the southwest 23d, 24th, and 31st; the dryest, coldest, and most changeable December in many years; a few days as cold as the coldest winter, then for as many days in succession genial spring weather.

*Statesville, N. C.*—Six inches of snow 15th; cloudy, misty, freezing all day, trees loaded, and ground covered with ice 22d.

*Asheville, N. C.*—Heavy rain all day 23d.

*Gowdeysville, S. C.*—Snow four and a half inches 1st; four inches of snow 15th; month colder than usual; changes of temperature sudden and extreme.

*Berne, Ga.*—Temperature of well-water 15 feet below the surface of the ground 59°, 1st; water froze during the night, 5th; thunder and lightning in the north 23d and 24th.

*Macon, Ga.*—Rain, with an unusual amount of thunder and lightning, 23d and 24th.

*Moulton, Ala* A few cold days; several white frosts; no snow to lie

upon the ground; no very heavy rains; the latter portion of the month mild and pleasant.

*Near Port Orange, Fla.*—Ground froze slightly 6th; heavy white frost 7th.

*Tampa, Fla.*—Frost 5th, 6th, and 7th.

*Newport, Fla.*—A delightful month.

*Austin, Texas.*—Sleet and snow 1st; frost 1st, 5th, 15th, and 24th; violent north wind with thunder and lightning 22d; diffuse lightning 31st.

*Brookhaven, Miss.*—White frost 1st, 2d, 5th, 6th, 11th, 15th, 16th, and 21st; but one entirely clear day this month, but the weather pleasant most of the time.

*Ponchatoula, La.*—First killing frost 5th; thunder-showers 23d and 31st; strawberries ripe and ripening 31st.

*Pochahontas, Ark.*—Sleet 2d; ice two inches thick 4th; ground frozen four inches 6th; drizzly, ice forming in the ground 22d; storm of thunder and lightning, wind in gusts, rain in showers 31st.

*Elizabethton, Tenn.*—Ground froze three inches deep 22d; the month remarkable for sudden and extreme changes of temperature; rain-fall small.

*Shelby City, Ky.*—First skating 2d, continuing to 21st; month very cold—first half dry, the last rainy.

*Mt. Auburn, Ohio.*—Miami Canal closed 5th; Ohio River closed 21st; continuous heavy thunder-showers 31st.

*Martin's Ferry, Ohio.*—Ohio River closed twice during the month; rain, thunder, and lightning 31st.

*Pennsville, Ohio.*—Several very heavy thunder-showers during the day, 31st.

*Northport, Mich.*—Weather severe; much more snow than usual; feed scarce.

*Litchfield, Mich.*—Not a day's sleighing during the month, but excellent wheeling; springs unusually low 31st.

*Monroe, Mich.*—Tornado from southwest, unroofing buildings, and throwing down parapets 23d.

*Grand Rapids, Mich.*—Sleighing nearly all the month; snow not deep at any time; weather unusually cold, cloudy, and windy.

*Mt. Carmel, Ind.*—Very warm, thunder and lightning 23d; very foggy with sleet 29th; very heavy thunder and bright zigzag lightning in the west 31st; very dry month; water scarce in wells and springs; some are hauling water for stock.

*Laconia, Ind.*—First half of the month dry and pleasant; not a clear day in the last half.

*Knightstown, Ind.*—Frost in the ground all the month.

*Dubois, Ill.*—Gale from southwest all day, fences and chimneys blown down, 23d; violent thunder-storm, the wind blowing fiercely 31st; month unusually dry.

*Manchester, Ill.*—Weather has been very changeable; a good deal of rain and thunder; the atmosphere smoky.

*Hennepin, Ill.*—Illinois River closed by ice 1st; ice on the river fourteen inches thick 31st.

*Belvidere, Ill.*—Bad sleighing and wheeling until 17th, afterward fair sleighing; first week cold, second moderate, third very severe, fourth severe.

*Embarrass, Wis.*—A cold month with only one clear day.

*Manitowoc, Wis.*—The coldest December in twenty-one years.

*Rocky Run, Wis.*—The coldest December since 1859.

*Bayfield, Wis.*—Snow 3d, 15th, 22d, 23d, and 29th; snow, hail, and rain 12th; harbor closed by ice 19th.

*Oak Lake, Minn.*—The severest December ever known here, and the greatest fall of snow for the month. Winter began the 18th of November, and has been hard ever since.

*Minneapolis, Minn.*—The coldest December since 1859.

*Algona, Iowa.*—A very cold month, but good weather for work.

*Logan, Iowa.*—The coldest December in ten years; good sleighing since the 17th; very little snow before that day.

*Fontanelle, Iowa.*—Thirteen inches of snow fell from 21st to the 23d; the coldest December on record.

*Cresco, Iowa.*—Cold intense and unexpected; frozen faces and extremities numerous; fevers, rheumatism, and severe colds prevalent; stock not well housed or fed suffering badly.

*Durant, Iowa.*—The rain of last night froze as it fell, coating everything exposed with ice three-fourths of an inch thick; trees damaged severely 23d.

*Mt. Vernon, Mo.*—A violent gale attended with thunder and lightning night of the 22d; much thunder and lightning night of the 30th.

*Williamstown, Kans.*—Weather beautiful, no snow 15th; cloudy 16th; stock doing well.

*Manhattan, Kans.*—Ice in the river eight and a half inches thick 5th; a dry, cold month.

*Burlingame, Kans.*—The severest month known to the oldest inhabitants; bare ground is frozen a foot deep; small streams frozen; nearly dry; changes of weather have been sudden and extreme.

*Emerson, Nebr.*—Depth of frozen ground one foot and four inches 26th.

*Harrisburgh, Utah.*—A fine month; the weather the last part very pleasant and warm; farmers cannot sow for want of water to irrigate their ground; no grass; farmers driving stock seventy-five miles east for pasture; breadstuffs very scarce; flour $10 per hundred.

*Denver, Colo.*—Ground thickly covered with snow the entire month, the mean temperature nearly eight degrees above that of December, 1870.

*Colorado Springs, Colo.*—The winter thus far has been unusually severe in the northern and eastern parts of the Territory; stock is suffering, and much will doubtless starve.